Negative

Advice

I'm going to discuss the strongest negative arguments to the Floating SMR affirmative

First, it is worth establishing that certain 1AC cards are about floating SMRs and certain are about land SMRs. While not included in this case neg, for further research a counterplan that only focused on land SMRs with a Floating SMR bad disad would require the affirmative to have a "floating" key warrant.

Second is the free market counterplan/disadvantage combination. This is a large strategy and show not be extended with a lot of other arguments in the block. The literature about government interference failing in the free market is amazing. Cross-X questions like "if SMR's are capable of being mass produced and are truly economically self-sufficient, why do they need government funding to succeed?" get to the heart of the success of the free market counterplan. If you win that SMR's are truly amazing and that industrialization is inevitable, then you can leverage your disad/net benefit of government interference causing SMR's to fail as a unique case turn against affirmative solvency.

Next is the DOD counterplan. This is a great counterplan to read politics as a net benefit to, as non-military in the topic means the affirmative cannot perm do the counterplan and the evidence that says the military is shielded from political backlash is A+. Furthermore, the counterplan only has the DOD do a *single demonstration* to prove feasibility, meaning certain arguments of the free market disad above apply as a net benefit.

Finally, a very strong argument is that the NRC will not license floating SMRs. The evidence is great that the NRC may never license another reactor, let alone an SMR in the next 10 years. It's a devastating timeframe take out if not a 100% take out. Thus, its worth it to invest heavily in that argument on solvency. It definitely is bad for solving warming.

Just as a last piece of advice, do not double turn yourself with a disad that says SMRs are bad and then the free market turns on case. Double check that the strategy is either A) SMRs are bad or B) SMRs good but the affirmative doesn't solve for SMRs/ the CP does.

Off Case

Topicality

1NC- “Non-Military”

Interpretation and violations

SMR’s that are used by the military qualify as “military”
OxfordDictionaries No Date (http://www.oxforddictionaries.com/us/definition/english/non-military)

non-military
Line breaks: non-military
Pronunciation: /nɒnˈmɪlɪt(ə)ri /
ADJECTIVE

Not belonging to, characteristic of, **or involving the armed forces**; civilian:
the widespread destruction of non-military targets

Kills negative ground- DOD counterplans are crucial negative ground- also blows the lids off limits by allowing any military aff- vote negative- competition interpretations are the only objective standard

1NC- Development

Interpretation and violation

Development means of the ocean itself

Merriam-Webster No Date (http://www.merriam-webster.com/dictionary/development)

de·vel·op·ment noun \di-ˈve-ləp-mənt, dē-\

: **the act or process of growing or causing something to grow or become larger** or more advanced

Development of the ocean is distinct from industrializing the ocean- development changes the composition ocean itself- industrializing the ocean opens the floodgates to thousands of affirmatives that just do things and put them on water- topical development affs are affirmatives that create agencies like the Interagency Ocean Policy Task Force

Gies '11 (Erica Gies, Independent environment reporter, founder of ThisWeekInEarth.com, "Ocean Sprawl: What Is It And What It Means for Business", http://www.forbes.com/sites/ericagies/2011/10/26/ocean-sprawl-what-is-it-and-what-does-it-mean-for-business/, October 26, 2011)

Industrial development is on the rise in ocean waters. So-called ocean **spatial planning seeks to balance development** and ocean protection **by using science to identify the most delicate ocean areas** and directing industry elsewhere. To many people, the oceans remain an enigma, a blank sheet of sparkling water beneath which we can imagine all is well. But in many places, all is not well: temperatures are rising, corals are bleaching, the oceans are turning more acid from absorbing excess CO2 pollution, land-based pollution is fouling salt water, overfishing has left fish stocks diminished and habitat damaged from trawlers. Already, it's a death by a thousand cuts. But industrial activities in oceans can also harm ecosystems: oil and gas extraction, sand and gravel mining, installation of underwater pipelines and utility cables, commercial shipping, aquaculture. New activities are also popping up: offshore wind, wave and tidal energy. When too many of these projects cluster in close proximity, it results in industrial sprawl, putting further pressure on already distressed natural habitats. Because the oceans are governed by many different agencies and laws, balancing ecosystem protection and economic development can be difficult. To facilitate these projects while protecting the ocean's natural resources — which provide us with many useful ecosystem services — Massachusetts thought it needed a plan. Leading on this issue in the United States, Massachusetts developed the Mass Ocean Plan as part of the Massachusetts Oceans Act of 2008. The management plan was formed with input from state legislators and agencies, fishing groups, the energy and utility industries, and environmental groups. Rhode Island followed suit in 2010. But state waters only extend three miles offshore. Federal waters have much greater reach, from three to 200 miles offshore. **In 2009**, President **Obama created** an **Interagency Ocean Policy Task Force to study and recommend strategies for better stewardship of U.S. ocean waters, coasts, and the Great Lakes.**

Voting issue for limits- smaller topics increase clash and research- collapse of limits kills negative preparation and ground- litmus test is whether affirmatives alter the oceans or just put things on top of it

Free Market Counterplan

1NC

Text: the United States federal government should [ ] through investment in basic research of X

Financial incentives for SMRs kill innovation – smothers the free market

Spencer '11 (Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy, Studies at The Heritage Foundation, "Congress's Recent Attempts to Promote Small Modular Nuclear Reactors Fall Short", http://thf_media.s3.amazonaws.com/2011/pdf/wm3283.pdf, June 8, 2011)

The House and Senate are considering bills that are meant **to** help **development** of small and modular nuclear reactors (**SMRs**). These new reactors could provide all of the attractive qualities of large reactors—such as being safe, emissions-free sources of electricity—but at lower upfront costs with greater flexibility. **Unfortunately, the two bills**—the Nuclear Energy Research Initiative Improvement Act of 2011 (S. 1067) and the Nuclear Power 2021 Act (S. 512 and H.R. 1808)—**would have the opposite impact**. **These bills would smother the private-sector initiative that has driven SMR development in recent years**. **Instead of embracing this new and innovative approach to nuclear energy development, these bills would subject the SMR business to the same government-depressed trajectory that plagues traditional reactors**. The Nuclear Energy Research Initiative Improvement Act (S. 1067). S. 1067 would authorize $250 million over five years to conduct research regarding SMR technology, power plant issues beyond nuclear technology, cost-efficient manufacturing and construction, licensing issues, and enhanced proliferation controls. **While the spirit** of the act **is laudable, its approach is mostly counterproductive**. The essence of the act is to mandate that the Department of Energy (DOE) develop a five-year plan to "lower effectively the costs of nuclear reactors." There are several problems with the act: • **More government support is not needed**. **Private investors have been driving the SMR business in recent years.** They recognized early on that small and modular rectors could potentially fulfill a market demand that large reactors could not fill, **and they have done it without government support.** • **The government is neither capable of reducing nor qualified to reduce the cost of nuclear reactors**. **Private industry has the interests, expertise, and background to develop cost-effective manufacturing and construction techniques. History demonstrates that government intervention would only slow the phenomenal progress made on the SMR front.** • **Government intervention has not produced a single new large reactor, and there is no reason to think it would work for SMRs. The** federal government's attempts to subsidize the commercialization of large reactors have failed to create a viable nuclear industry. **In contrast, the SMR business has by and large built privately funded commercial enterprises out of federal research and development projects.** Instead of controlling this innovation through DOE meddling, the federal government should embrace it as a model for other energy sectors. • The bill plays into the hands of the anti-nuclear lobby. The bill directs the DOE to conduct "public workshops" to generate "public comment" to inform its five-year plan. This opens the door to over-politicization and legal sandbagging—two of the anti-nuclear lobby's favorite progress-killing tactics. • Creating an arbitrary timeline makes no sense. **Government program timelines to produce commercial projects do not work**. **Once the government creates a development program, the market begins to revolve around it.** Then, as the timeline slips—as timelines always do—so does the eventual introduction of the products. **Timelines should be market- and investor-driven, not dictated by Congress** or the DOE. The Nuclear Power 2021 Act (S. 512 and H.R. 1808). The Nuclear Power 2021 Act creates a DOE program to develop two standard SMR designs and demonstrate the licensing process for those designs. In essence, it authorizes the DOE to dictate who will make up America's SMR business for the foreseeable future.

Unending subsidies cause market distortion and turn case- the counterplan has the government generate demand through investing in basic research- generates self-sustainability

Nahi '13 (Paul Nahi is CEO of Enphase Energy, a provider of micro-inverter systems for the solar industry, "Government Subsidies: Silent Killer Of Renewable Energy", http://www.forbes.com/sites/ciocentral/2013/02/14/government-subsidies-silent-killer-of-renewable-energy/?ss=business%3Aenergy, February 14, 2013)

Hardly a day goes by that we don't hear or engage in a conversation about energy. Too often, those conversations are about failed companies that lived only for government largesse. Whether the discussion is about the cost of energy, the damage being done to the environment, or national security issues, there is one constant: everyone agrees that the world needs safe, clean, and affordable energy. As the chief executive of a solar technology company, no one wants an abundant supply of clean energy and a healthy solar energy industry more than I do. **And the best pathway to a stable renewable energy industry is to create self-sufficiency and independence from government financial assistance.**

One might question the rationality of this position, given the fact that between 1994 and 2009 the U.S. oil and gas industries received a cumulative $446.96 billion in subsidies, compared to just $5.93 billion given to renewables in those years. (The nuclear industry, by the way. received $185 billion in federal subsidies between 1947 and 1999.) Certainly, subsidies are a useful tool to help establish an emerging industry. But **where there is no projected end to funding, subsidies stop being a catalyst, and start becoming a crutch. This is especially true when companies supported by subsidies become powerful enough to influence governments to perpetuate their support.**

Healthy companies depend upon sound business models in a competitive environment. **Lousy companies that are limping along on subsidies will slow the growth of the industry. If a product is well designed and meets the needs of the consumer, it will find success in a market economy**. In that same market, the real costs of the product are accounted for in a company's profit margin. That is not true of traditional energy companies. **Complex and arcane tax laws are used to subsidize these corporations and obscure the true cost of energy**. **Government subsidies effectively transfer a portion of the costs to taxpayers, enabling artificially low prices and inflated profits.**

Equally dangerous is the government's direct investment in private companies. **Much has been made of the current administration's investments in certain renewable energy companies**, some of which failed. The politically motivated headlines concerning these investments may serve as a rallying cry for critics, but they fail to identify the fundamental mistake**. If the administration is trying to cultivate a new industry by leveling a playing field, it needs to focus on demand creation and not try to manage supply. In doing so, it will unleash talented entrepreneurs – as well as the investors willing to back them. Some companies will survive, others will not**. But **those that do will have the essential ingredients for sustained success.**

There is absolutely a role for government in technology development. **Most companies, especially young ones, cannot afford to invest in basic research. The time frames are long, and only a small portion of the research results in commercially viable products.** Yet, **this research is the foundation of future industries. Investment in basic research, through our universities and research institutions, that yields licensable technologies, is a more prudent path for the allocation of public resources.**

The confusion behind energy subsidies coupled with slanted media coverage has resulted in a myth that solar power is not cost competitive and is dependent on government subsidies. This is simply false.
In many parts of the country today, solar energy is less expensive than conventional forms of energy, creating consumer demand for solar to reduce monthly energy bills. And the solar industry is both an affordable and sustainable source of clean energy, and a significant job creator. The U.S. solar workforce today is around 120,000 strong and growing.
The facts are clear. The costs of development and production of fossil fuel energy have been underwritten with our tax dollars to the benefit of a few traditional energy companies**. If we build the true costs into the price of all energy, solar power is not only competitive, it's cheaper. However we will only see that truth if we remove direct and indirect energy subsidies.**
We have a strong market for solar power today. We have a willing market, the necessary technology, and an undisputable imperative to create a cleaner, safer planet. I'm committed to leading a company that delivers the best technology and service. We will continue to revolutionize power generation on a global scale, one kilowatt hour at a time. But **a robust, renewable energy market will remain hampered if the energy industry continues to chase the next subsidy.** For the good of our energy future, **subsidies for all energy must eventually end.**

If the plan succeeds- it just creates a bubble in the green economy by propping up the industry- turns case

Tracinski '12 (Robert Tracinski, Robert Tracinski writes daily commentary at TIADaily.com, "The Global Warming Bubble", http://www.realclearmarkets.com/articles/2012/03/06/the_global_warming_bubble_99552.html, March 6, 2012)

When the federal government bailed out General Motors, you may remember that we were told the government would transform GM by moving it away from manufacturing big, gas-guzzling trucks and SUVs (you know, the vehicles that were actually making a profit) and instead make sure that GM rode the real wave of the future: electric cars. Well, here's where the wave of the future has taken us: GM just shut down the assembly line of its electric car, the Chevy Volt, for five weeks because demand for the Volt is making the Edsel look like a roaring success. Observers are divided over whether the Volt has flopped because of its limited all-electric range, its high price tag (despite massive government subsidies), or the fact that its battery might have a tendency to catch on fire. **The Volt is just the latest commercial failure for "green" technology**. **We are in the middle of** what you might call **a global warming bubble**. It is a failure of the global warming theory itself and of the credibility of its advocates, but also a failure of the various "green energy" schemes proposed as a substitute for fossil fuels. Take the sleek Tesla electric roadster, brought to you with about half a billion dollars in government-backed loans, which turns into an immovable "brick" if you run down its battery too far, say, by taking a long drive and parking it for a while. **The failure of the solar panel maker Solyndra has been followed by the bankruptcies of a variety of other government-subsidized green energy firms**, such as Beacon Energy, which makes an energy storage device needed to smooth out the energy production of erratic "renewable" sources, and battery maker Ener1. But maybe we're just not subsidizing green power enough, because surely you've heard--probably from Tom Friedman--that China is beating us to the future with its support for green energy. But China's solar energy firms are also heading into a slump and laying off workers. Part of the reason for the solar slump in China is that they were counting on generous subsidies for their product from the West, particularly Europe. In effect, the Chinese were manufacturing solar panels in order to cash in on subsidies from Western taxpayers. But now the

subsidies are drying up. That leads us to the most interesting of these stories. Germany is phasing out its solar subsidies, but the economically revealing part is why they are eliminating the subsidies. As Bjorn Lomborg explains: "Subsidizing green technology is affordable only if it is done in tiny, tokenistic amounts. Using the government's generous subsidies, Germans installed 7.5 gigawatts of photovoltaic capacity last year, more than double what the government had deemed 'acceptable.' It is estimated that this increase alone will lead to a $260 hike in the average consumer's annual power bill." At the end of last year, I wrote (in my own newsletter) about the marginal economics of the welfare state. Many welfare-state policies seem to work so long as they are implemented on a small scale but fail when they are expanded to cover a larger portion of the population. The Medicare program, for example, takes advantage of the fact that it can dictate lower prices for medical services, because it only needs to pay the marginal costs (the relatively low cost of treating one additional patient in an existing hospital), while non-Medicare patients are billed at higher rates to cover big capital expenditures (the cost of building the hospital in the first place). But if the government starts paying for all health care, it suddenly has to pay a lot more to fund those capital expenditures. **Something similar applies to green technology. It can be sustained only as a token or showpiece designed to distract attention from all of the coal, natural gas, and nuclear power stations that actually keep the lights on.** The Chevy Volt, for example, is openly billed by GM as a "loss leader": they're losing money on it for the sake of all of the good "green" PR they hope to get. But the moment you try to use these technologies to generate a noticeable portion of a nation's electricity, the costs rise to ruinous levels. Thus, as Lomborg explains: "Solar power is at least four times more costly than energy produced by fossil fuels. It also has the distinct disadvantage of not working at night, when much electricity is consumed. "In the words of the German Association of Physicists, 'solar energy cannot replace any additional power plants.' On short, overcast winter days, Germany's 1.1 million solar-power systems can generate no electricity at all. The country is then forced to import considerable amounts of electricity from nuclear power plants in France and the Czech Republic." The same applies to wind energy, too, for the same reason. Just as the sun doesn't shine consistently every day, so the wind does not blow consistently. The natural fluctuation of wind power means that every megawatt of wind power requires an equal amount of conventional, fossil-fuel-powered generation to prevent power dips on the electric grid. Which is to say that solar panels and windmills are really just ornaments. They are monuments to greener-than-thou environmental vanity. That these forms of renewable energy are capable of generating only minimal amounts of power is no accident. Ten years ago, I published an article by Jack Wakeland which examined the growth of "renewable energy" and concluded that every time an "alternative" power source grew large enough to produce energy on a truly industrial scale, environmentalists turned against it, as they have done with hydro-electric dams, geothermal plants, and even wind farms. So the fact that green energy is capable of generating only a small fraction of the power needed to fuel an industrial civilization is no accident. In effect, the inability to generate industrial-scale power is what makes green energy green. But **what that means is that green energy is doomed as an economic proposition. It has all of the hallmarks of an economic bubble. As with the Internet, housing, and higher-education bubbles, green energy is fiercely believed in, not just as an investment but as a superior lifestyle and a positive social good.** And as with housing and education, **it is propped up by government tax breaks, loan guarantees, and massive subsidies, all of which support a growing edifice of economically unproductive activity**. But **this artificial stimulation eventually expands the industry beyond the point where it can be sustained, either economically or politically, and the bubble bursts.**

2NC Overview

2NC Overview

The affirmative has the government disburse unconditional funds upfront - that causes market inefficiency and dependency- the counterplan has the government invest in basic research- the affirmative creates supply of the product but the counterplan generates DEMAND for the product -

Their case solvency arguments generate solvency and uniqueness for the counterplan- "If a product is well designed and meets the needs of the consumer, it will find success in a market economy"- that's Nahi

Any solvency deficit to the counterplan is turned by our bubble argument which says any short term success of the affirmative is only propped up by a larger irreversible bubble which inevitably collapses the industry- only the counterplan slow-rolls the aff through basic research- that's Nahi and Tracinkski

Governments lack the precision to carry out the mechanism of the affirmative

Gordon '8 (Richard L. Gordon is professor emeritus of mineral economics at the Pennsylvania State University, "The Case against Government Intervention in Energy Markets Revisited Once Again", No. 628 December 1, 2008)

A key aspect of the modern economic theory of intervention is skepticism about whether governments in fact have the ability and desire **to remedy market failures and increase efficiency.** As a result, **theories of government failure have proliferated**. Columbia economist Jagdish **Bhagwati has neatly summed up the standard uses** of market-failure arguments **as the "puppet government approach**." 91 **The old-fashioned textbook government possesses far more prescience and acceptance of economic principles than do actual governments**. **Real governments lack the competence and the motivation to increase efficiency.** Moreover, **intervention is expensive to design and operate properly**. Thus, the inefficiencies must be great for regulation to be desirable. A remarkable article by Ronald Coase, "The Problem of Social Cost," is the critical source of the last point and a much more modern appraisal of intervention. 92 In the essay, Coase dealt with a much-discussed but badly dated analysis of "externalities" by A.C. Pigou, a longtime professor of economics at Cambridge University. Externalities are the incidental effects of economic actions on people who are not directly involved. These can be harmful, as with pollution and noise, or beneficial, as with pollination of plants by bees. Coase emphasized two defects of Pigou's analysis. First, Pigou presumed that government intervention always was needed, but Coase provided numerous examples of how cures to externality problems were secured privately. Second, Pigou asserted that, when confronting positive externalities (where by definition the costs to society were lower than the costs to the private producers or consumer), a subsidy to the producer or consumer was appropriate. Conversely, negative externalities should be taxed. Coase showed that this also was wrong; subsidizing the abatement of a detrimental externality would produce the same result as a Pigouvian tax. Coase's insights proved remarkably impervious to criticism. Two potential problems, however, are evident. First, Coase tacitly assumes that the beneficiaries of the tax are not so different from the beneficiaries of the subsidy that demands shift. Second, an implicit further condition of optimum externality response is that the response should ensure that only firms whose total social value exceeds their total social costs should survive. The correct social policy requires additional measures to attain this goal. 93 Coase is well aware that the choice of policy response affects the welfare of those involved. By example, he shows that those harmed by the externality are not always the ones whom it is appropriate to compensate. In some cases, these victims knowingly moved near an existing externality-producing entity, about which the newcomer should have been aware. Coase moves so tersely through the arguments that many commentators over looked or misunderstood his discussion of why private action may not resolve the externality problem. 94 Coase argued that when a large number of people are involved, the transaction costs associated with providing for a remedy could prove to be so steep that private action would be difficult to implement. However, he presented two objections to the presumption that such high transaction costs justified government action. First, with sufficiently high trans - action costs, even if the government can act more cheaply than private groups, the total costs of intervention will still exceed the benefits. High enough

transaction costs can be a barrier to both private and public externality remedies. Second, even if this is not true, a public solution is not necessarily preferable to a private solution. **Given the limitations of governments, the inefficiencies of a private solution may be less than those of a public one**. In a follow-up article, "The Lighthouse in Economics," Coase showed that the traditional assertion that lighthouses were a clear example of a good that had to be supplied by government was historically invalid. In the United Kingdom, the government took over lighthouses only after a private association successfully established a system of lighthouses. 95 George Stigler observed that Coase's analysis applied to all market failures. 96 Stigler stressed that **with low enough transaction costs, market failures could all be overcome privately. Coase's caveats about the implications of high transactions also apply to all interventions**. While Coase seems never to have made the links explicit, these arguments are closely related to another celebrated contribution to the literature—Paul Samuelson's 1954 analysis of the justification of government action. 97 Samuelson employed the concept of "publicness," in which a good could not be made available exclusively to individuals; if one person received it, everyone did. Everyone in society then would benefit from the private consumption of a public good. Private solutions, however, would fail to adequately recognize all of these benefits. Thus, the government should provide the goods. Coase's analysis can be restated as indicating that it is only when publicness was involved that government intervention to address externalities might be justified. Coase can then be credited with creating a different and superior theory of government action: it is only when transaction costs are high (but not by a degree to render action unprofitable) that government intervention might be desirable. The advantage of Coase's approach is that it leads to a consideration of critical problems that the Samuelson analysis ignores. First, considerable evidence exists that **politicians have motivations far different from attaining an efficient supply of public goods**. 98 Second, the Coase problem of attaining an optimum is formidable. **Governments often lack the competence to identify and optimally correct inefficiencies. Both these difficulties are extensively reviewed in the economics literature, but the bad-motivation argument is stressed more** than the limited-ability concern. 99 **The adoption of inappropriate objectives is the subject of a very rich literature that examines the motivations of political actors.** The starting point is Schumpeter's observation that, in a democracy, political actors are primarily engaged in a competition for votes. 100 As numerous subsequent observers have noted, one key way to secure votes is to legislate an (economically) inefficient policy—in which a few beneficiaries each receive gains large enough for them to note—by creating losses for many others that are too small for any to notice. 101 Some **observers, notably Harvard economist** Joseph **Kalt**, have **examined the proposition that**, in some cases, **action arises only from an ideological preference for intervention by legislators whose constituents lack significant interest in an issue**. 102 **Kalt and collaborators have found statistical support for this proposition.** 103 A simpler possibility is that **politicians instinctively believe that if a problem arises which receives extensive attention, they can—and should—intervene**. The problem of determining and satisfying demands for public goods is more loosely treated in the literature. Economists Ludwig von **Mises, F. A. Hayek, and Ronald Coase have all argued that**, among other things, **governments cannot readily secure the information needed for efficient intervention**. 104 Coase's treatment is far less extensive, but also far more general, than those of Mises or Hayek. **Their extended writings on socialist calculation**, nevertheless, **should have made clear the difficulties of optimally devising plans for any kind of government spending**. The debate was started by an assertion by Mises that **a socialist state could not be efficient because it lacked information about the demands for commodities**. 105 In the most celebrated response, Oscar Lange 106 replied that this problem could be resolved by establishing planning boards to measure demands and set prices appropriate for those demands. Hayek answered Lange by noting that this was a much more cumber - some approach than an unregulated marketplace. Mises asserted that the solution would break down for producers' goods because of concentration of ownership in state monopolies.

Solvency

2NC Solvency Wall

The counterplan solves better than the plan-

Major clean tech coming now due to a deficit in basic research and dependency on subsidies- increasing government investment in basic research is a pre-requisite to solving-

Rejecting government interventions creates better large-scale reactors – independent solvency mechanism

Spencer and Loris '11 (Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies, and Nicolas D. Loris is a Research Associate in the Roe Institute, "A Big Future for Small Nuclear Reactors?", February 2, 2011)

• **Reject additional loan guarantees. Loan guar- antee proponents argue that high up-front costs of new large reactors make them unaffordable without loan guarantees. Presumably, then, a smaller, less expensive modular option would be very attractive to private investors even without government intervention. But loan guarantees undermine this advantage by subsidizing the capital costs and risk associated with large reactors. A small reactor industry without loan guarantees would also provide competition and downward price pressure on large light water reactors.** At a minimum, Congress should limit guarantees to no more than two plants of any reactor design and limit to two-thirds the amount of any expanded loan guarantee pro- gram that can support a single technology. **Such eligibility limits will prevent support from going only to a single basic technology, such as large light water reactors**.13

Empirics prove nuclear power is built out of the free market

Spencer and Loris '11 (Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies, and Nicolas D. Loris is a Research Associate in the Roe Institute, "A Big Future for Small Nuclear Reactors?", February 2, 2011)

• **Avoid subsidies. Subsidies do not work if the objective is a diverse and economically sustainable nuclear industry. Despite continued attempts to subsidize the nuclear industry into success, the evidence demonstrates that such efforts invariably fail. The nuclear industry's success stories are rooted in the free market. Two examples include the efficiency and low costs of today's existing plants, and the emergence of a private uranium enrichment industry. Government intervention is the problem, as illustrated by the government's inability to meet its nuclear waste disposal obligations.**

***be skeptical of any solvency claims the government has already spent 80 billion dollars in direct investment**

Swezey '11 (Swezey, Project director for Breakthrough Institute, "Clean Tech Sector Heading for a Major Crash", http://blacklistednews.com/?news_id=14600&print=1, July 11, 2011)

The global clean energy industry is set for a major crash. The reason is simple. **Clean energy is still much more expensive and less reliable than coal or gas,** and in an era of heightened budget austerity **the subsidies required to make clean energy artificially cheaper are becoming unsustainable.** Clean tech crashes are nothing new. The U.S. wind energy industry has collapsed three times before, first in the mid 1990s and most recently in 2002 and 2004 when Congress failed to extend the tax credit that made it profitable. But **the impact and magnitude of the coming clean tech crash will far outstrip those of past years.** As part of its effort to combat the economic recession, **the federal government pumped nearly $80 billion in direct investment and tax credits into the clean energy sector, catalyzing an unprecedented industry expansion.** Solar energy, for example, grew 67% in the United States in 2010. The U.S. wind energy industry also experienced unprecedented growth as a result of the generous Section 1603 clean energy stimulus program. The industry grew by 40% and added 10 GW of new turbines in 2009. Yet many of the federal subsidies that have driven such rapid growth are set to expire in the next few years, and clean energy remains unable to compete without them. **The crash won't be limited to the United States.** In many European countries, **clean energy subsidies have become budget casualties as governments attempt to curb mounting deficits**. Spain, Germany, France, Italy and the Czech Republic have all announced cuts to clean energy subsidies. Such cuts are not universal, however. China, flush with cash, is bucking the trend, committing $760 billion over 10 years for clean energy projects. China is continuing to invest in low-carbon energy as a way of meeting its voracious energy demand, diversifying its electricity supply, and alleviating some of the negative health consequences of its reliance on fossil energy. **If U.S. and European clean energy markets collapse** while investment continues to ramp up in China, the short-term consequences will likely be a migration of much of the industry to Asia. As we wrote in our 2009 report, "Rising Tigers, Sleeping Giant," **this would have significant economic consequences for the United States, as the jobs, revenues and other benefits of clean tech growth accrue overseas**. In the long-term, however, clean energy must become much cheaper and more reliable if it is to widely displace fossil fuels on the scale of national economies and become a commercially viable industry. Breaking the Boom-Bust Cycle **Why is the United States still locked in this self-perpetuating boom-bust cycle in clean energy? The problem, according to a** new essay by energy **experts** David **Victor and** Kassia **Yanosek in this week's Foreign Affairs, is that our system of clean energy subsidization is jury-rigged to support the deployment of only the least-risky and most mature clean energy technologies, while lacking clear incentives for continual innovation that could make clean energy competitive on cost with conventional energy sources**. **Rather, we should "invest in more innovative technologies that stand a better chance of competing with conventional energy sources over the long haul.**" According to Victor and Yanosek, nearly seven-eighths of global clean energy investment goes toward deploying existing technologies that aren't competitive without subsidy, while only a small share goes to encouraging innovation in existing technologies or developing new ones. This must change. **Rather than simply subsidize production of current technologies, we need a comprehensive energy innovation strategy to develop, manufacture, and deploy riskier but more promising clean energy technologies that may eventually compete with fossil energy at scale. Instead of rewarding companies for building the same product, we should reward companies who continuously improve designs and cut costs over time. Such a federal strategy will require major federal investments, but of a different kind than the subsidies that have driven the clean tech industry in years past. For starters, we must dramatically ramp up funding for early-stage**

clean energy research and development. A growing bipartisan group of think tanks and business leaders have pushed an investment of at least $15 billion annually in energy R&D, up from its current $4 billion level. Targeted funding is needed to solve technology challenges and ensure that innovative technologies can develop and improve. One key program that helps fulfill this need is ARPA-E, which funds a portfolio of innovative technology companies and helps connect them with private investors. But ARPA-E's budget has continually been under assault in budget negotiations, hampering its ability to catalyze innovation in the energy sector and limiting its impact. We also need to invest in cutting-edge advanced manufacturing capabilities and shared technology infrastructure that would help U.S. companies cut costs and improve manufacturing processes. As the President's Council of Advisors on Science and Technology wrote in a report released last week, manufacturing is vital to innovation, "because of the synergies created by locating production processes and design processes near to each other." Furthermore, bringing down manufacturing costs, such as by supporting shared infrastructure for small firms, or offering financing for the adoption of innovative technologies in manufacturing, will be a key component of reducing the costs of new clean energy innovations. Lastly, the nation's hodgepodge of energy deployment subsidies is in dire need of reform. As Breakthrough and colleagues wrote in "Post-Partisan Power," **we need an energy deployment regime that demands and rewards innovation, rather than just supporting more of the same**. Brookings' Mark Muro (a co-author or PPP) expands, "targeted and **competitive deployment incentives could be created** for various classes of energy technologies **that would ensure** that each has a chance to mature even as each is challenged to innovate and locate price declines." Rather than create permanently subsidized industries, **such investments would "provide the opportunity** for opportunity for all emerging low-carbon energy technologies **to demonstrate progress toward competitive costs," while speeding commercialization**. It is clear that the current budgetary environment in the United States presents challenges to the viability of the fast-growing clean energy industry. But it also presents an opportunity. **By repurposing existing** clean energy **policies** and investing in clean energy innovation, **the United States can** be the first country to make clean energy cheap and reliable, a distinction that is sure to **bring major economic benefits in a multi-trillion dollar energy market**.

CP leads to better private sector adoption

Thorning '11 (Margo, Chief economist for the American Council for Capital Formation, "Stop DOE's Double Down on Risky Energy Ventures," http://energy.nationaljournal.com/2011/09/what-role-should-government-pl.php, September 29, 2011)

DOE's race against the clock to approve more guaranteed loans for energy projects that haven't been properly vetted is completely reckless after the Solyndra fiasco. The government should **limit its involvement and funding to basic research** on alternative energy sources **and should not be funding risky "start-ups."** If a renewable technology makes economic sense, the private sector will adopt it and **it will succeed without** mandates and **subsidies**. Federal and state governments should not mandate renewable energy, it's cost is usually at least twice that of conventional energy and places an economic burden on households and industry (see Energy Information Administration data on cost of renewable electricity at http://www.eia.gov/oiaf/aeo/electricity_generation.html).

The private sector covers the development side- the counterplan's research side is key

CBO '7 (Congressional Budget Office, "Federal Support for Research and Development," http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/82xx/doc8221/06-18-research.pdf, June 2007)

Research—**especially basic research**—generally produces larger external effects, or **spillovers**, than **development** does, suggesting that the government's involvement in such research may lead to more spillovers than those generated by its support of development activities. The purpose of basic research (for example, physics research on the properties of elementary particles) is to make discoveries that expand scientific knowledge, even though commercial applications of that knowledge may be far in the future and not readily identifiable. Applied research (for example, the discovery of new materials for drug delivery) is a step closer to commercialization because it seeks to connect scientific knowledge to some practical purpose. Development applies scientific knowledge to the creation of specific marketable products. The **private sector has more** of an **incentive to invest in development** activities than in **basic** or applied **research**, for several reasons: the uncertainty surrounding the results of research, the long time horizon needed to commercialize research findings, the lack of connection of research in many instances to the current demand for products, or some combination of those factors. 15 And even if all of those problems could be addressed, **underinvestment** in research by the private sector might still occur, because the returns to research for private firms, unlike the social returns, do not encompass the benefits that research might bring to others who could also put that knowledge to use.

AT: Valley of Death

"valley of death" doesn't exist –it's just an excuse to explain failed ideas

Glenn '12 (Brandon, Writer for Med City News, "Is the early stage funding valley of death a myth?," http://medcitynews.com/2012/02/is-the-early-stage-funding-valley-of-death-a-myth/#ixzz2GxtiPq53, February 10, 2012)

You can't read much about the venture capital industry before you start hearing about the so-called "valley of death" for early stage companies.

Conventional wisdom holds that young companies enter that valley, in which attracting investment capital becomes extremely difficult, at an early stage, typically between an initial round of angel funding and the company's first institutional series A round. But is the whole valley of death concept just **media-fueled hype**? Maybe so. "From my perspective, **there is no valley of death**," said Tim Moran, CEO of PediaWorks, speaking on an Ohio Venture Association panel on the topic. As Moran pointed out, if you subscribe to the theory of efficient markets, then it's tough to say there are tons of investment-worthy deals floating around that aren't drawing cash. When it comes to capital funding, the continuum typically looks like a funnel: In the early stages, **lots of companies** can get an investment, but as time goes on, more and more companies encounter problems and drop off. (Think of companies failing as the narrowing of the funnel.) That's essentially nothing more than a culling of the herd, a Darwinian means of separating the companies that can prosper from those that can't. Plus**,** angel investors, to some extent, and the government, to a lesser extent, have stepped up to fill the void created by a thinning of the ranks of venture capital firms in funding young companies. Unfortunately, the hard truth for many hungry and hardworking entrepreneurs is that if you fail at fundraising, there's probably a good reason for it.

"Maybe your idea just isn't good enough, or you're not a good enough entrepreneur," Moran said.

Politics Net Benefit

BASIC RESEARCH is popular- the affirmative focuses on development- ARPAE- E would enforce the counterplan

LaMonica '12 (Martin LaMonia, contributing editor at MIT Technology Review, "Should the government support applied research?" http://www.technologyreview.com/news/428985/should-the-government-support-applied-research/, September 10, 2012)

The presidential campaign has revived the long-running policy debate over what role government should play in funding the **development of new technologies**. While **almost everyone believes** that it has a role in supporting **basic research**, the consensus breaks down at **later and more expensive stages of development**, such as demonstration projects. Historically, some Republicans have picked fights to keep agencies from giving grants for early-stage product research, a line that ARPA-E crossed intentionally when it was created in 2007. **ARPA-E** has funded around 200 projects, all of them meant to be "transformative" ways to either help replace foreign oil or reduce emissions. The notion is that such projects are too speculative and risky to gain large investments from companies. "I think it's hard to argue the types of investments that ARPA-E is making would be made by the private sector if ARPA-E did not exist," says Greg Nemet, an assistant professor of public affairs and environmental studies at the University of Wisconsin. The agency, which had a modest budget of $180 million in 2011, **has many fans** in Congress, **including** among **Republicans**. That means it could avoid cuts and may see its budget increase. However, last year some House members said the agency should be defunded because its projects are too commercial and sometimes replicate work already paid for by the private sector. Critics claim one problem is that ARPA-E isn't able to find enough research that is truly transformative. Eric Toone, the agency's principal deputy director, calls the debate over spending a "worthy" one, but says most people agree ARPA-E is funding technologies at stages where there is a "legitimate role for public investment." "Are we going to run out of great ideas?" he asks. "If we keep collecting the best and brightest people of America, there's lots to do here and there's lots of good ideas." ARPA-E grants are meant to help move research ideas to the prototype or demonstration stage. **Projects are given specific performance goals**—such as increasing how much energy can be stored in a battery—**that, if achieved, would take technology a few steps beyond the best commercial products**. It has financed projects such as making liquid "electrofuels" directly from microörganisms fed electricity, chemicals, and carbon dioxide, as well as a flying wind turbine (see "Flying Windmills") and new materials to capture carbon from coal plants. At the agency a team of scientists actively manage research programs. It's not uncommon for them to pull the plug if technical milestones aren't met. Such failures are partly by design. Grants are kept small (on average, about $3 or $4 million each)—part of an approach designed to pull a few winners out of a large pool of attempts. While ARPA-E has generated a share of exciting projects, it does have one clear flaw: a lack of end customers. "The big problem that makes energy different from most other startup enterprises is that even if you have something that works great, you probably never amass enough money to commercialize it," says Donald Paul, executive director of the University of Southern California's Energy Institute and former chief technology officer at Chevron. That's where the Obama administration ran into trouble. The DOE tried to help some technologies toward large-scale commercialization, but **after** the bankruptcy of solar-panel maker **Solyndra** (recipient of a $535 million DOE loan guarantee), Republicans jumped in, accusing Obama of **playing**

politics with technology. It's become a campaign talking point: Ryan's website calls for "getting Washington out of the business of picking winners and losers in the economy," including the energy sector. Although Romney has praised ARPA-E, he's echoed the Republican concerns by saying the agency should step back and concentrate on "basic research."

The distinction empirically makes all the difference

Khimm '12 (Suzy, Writer for the Washington Post, "Republicans want to take the 'D' out of government 'R&D,'" http://www.washingtonpost.com/blogs/wonkblog/post/republicans-want-to-take-the-d-out-of-government-randd/2012/06/04/gJQAmOJ7DV_blog.html, June 4, 2012)

By and large, both parties have been able to agree on that much: Congress has largely spared **basic research and development** from the chopping block during recent budgets; both houses are even pushing for more funding for agencies such as the National Science Foundation in 2013. But there are cracks emerging in that bipartisan consensus: House **Republicans** are becoming increasingly wary of funding energy innovation that support the **second half of "R&D"--the development** necessary to transform scientific research into technological innovation that ultimately would be used and commercialized outside of the lab. Earlier this spring, the House Appropriations Energy and Water Subcommittee passed a bill for 2013 that would cut funding for energy R&D by 27 percent.

AT Solvency Deficit

AT: Government K2 Prediction/ Foresight

Private sector is better than the government at foresight and predictions- empirics prove

Gordon '8 (Richard L. Gordon is professor emeritus of mineral economics at the Pennsylvania State University, "The Case against Government Intervention in Energy Markets Revisited Once Again", No. 628 December 1, 2008)

People who are **alarmed about trends in energy markets** commonly **contend** that **a decline of oil production is impending**, **yet private investors are not correctly anticipating this development**. **These assertions inevitably link back to** M. King Hu**bbert's inadvertently prescient prediction of a decline in** U.S. **oil** production. Hubbert's analysis, however, was based on a statistical appraisal of the physical availability of oil in the United States, not in the world as a whole. **In practice, economic limits to production kick in well before geological limits, and that is what happened in the United States**. Oil production declined, not because of depletion, but because a superior (less-costly) alternative—Middle Eastern oil—arose. The peak was reached later than was desirable because of the federal government's policy of restricting oil imports. Thus, it was dumb luck that the pattern of decline dictated by changing energy policy matched what Hubbert expected due to physical limits. **The imperfect-foresight argument**, in general, **is an absurdity**. **To believe** that **governments are better anticipators of the future than private investors ignores the vast record demonstrating the contrary**. 55 T**his is particularly true of the extreme** pro-government **claims discussed further below**. **These views posit a government dispassion and wisdom that is lacking in the private sector. Experience shows the opposite**. **The private sector has the advantage of a multiplicity of actors whose survival depends on correct decisions**. **In theory, things might be so unpredictable that disaster might arise from sudden changes that no one could foresee. This is unlikely in energy.** The **participants are always concerned about, and act to anticipate, future developments**. The large size and profitability of oil companies reflects their skills at appraising prospects. **If the companies fail, no one else will do better.**

AT: Investors Don't Invest in Key Tech

Investors do invest in key technology- post world war 2 tech proves- they don't invest in the plan only because it is insignificant

Gordon '8 (Richard L. Gordon is professor emeritus of mineral economics at the Pennsylvania State University, "The Case against Government Intervention in Energy Markets Revisited Once Again", No. 628 December 1, 2008)

An alternative view employs an often used but **wildly implausible concept of market failure–the belief that market actors will not establish enough procedures to hedge risks and thus will produce inefficiently low levels of investment**. Ronald Coase's point (see below) about the costs associated with transactions such as hedging is the critical analytic response to the criticism. 56 **Every possible risk is not hedged simply because most of them are too small to justify establishing protective measures. The facts are even more devastating. The years since World War II have seen the rise of a vast array of new financial instruments**. Mutual-fund companies have introduced a stunning variety of options that differ in the extent of their active management, whether stocks, bonds, or other assets are involved, what countries are included; in what sectors of the economy investments are made; and in which markets the shares are purchased. Futures markets emerged for crude oil when the major oil companies lost their oil concessions from OPEC nations.

AT: Plan K2 Stabilize/ Secure Market

The stability the plan produces is artificial and thus bad- market instability is necessary to generate a healthy economy

Leonard '11 (Jeffrey Leonard is CEO of the Global Environment Fund, a growth-capital-oriented investment firm, and chairman of the Washington Monthly board of directors. He is the author of five books and numerous articles on issues relating to energy, the environment, and economics, "Get the Energy Sector off the Dole", http://www.washingtonmonthly.com/features/2011/1101.leonard-2.html, Washington Monthly, January/February 2011)

There is no question that the **elimination of** energy **subsidies** across the board **would bring disruptive change to the energy landscape**. Oil producers would keep profiting handsomely but mourn the elimination of their deeply embedded—and beloved—government largess. But **they would** probably **start to invest a lot more** of their available **capital in energy industries and technologies of the future**. **Nuclear energy advocates and ethanol producers**—the recipients of the lion's share of "new energy" subsidies awarded in recent years, and poised to receive hundreds of billions of new subsidies in coming years—**would see their so-called private funding sources shrivel overnight**. **And renewable energy interests,** newly nurtured on the mother's milk of Washington cash, **would have to scramble to cut costs rapidly to ensure continued consumer demand**. **Some players in the renewable energy industries would be less competitive, and eventually would go out of business, but others would take their place—and do much better in honest competition.** The winner, in spite of its loss of subsidies, would be natural gas. It is the cleanest and most intrinsically competitive energy source for electricity production and as a direct fuel for heating homes and commercial spaces. The real question to ask is not whether some energy companies, and indeed whole industries focused on certain "protected" or government-favored technologies or fuels, would survive in their current form if we did slash energy subsidies. Imagine where the American economy would be today if the government had decided to protect and continue to subsidize steam engines or whale oil as sources of energy in past eras. **The important question is whether the elimination of energy subsidies would constitute good long-term energy policy for America**. Never in my lifetime has it been more important to ask this question.

AT: Government Generates Innovation

The government fails at innovative policy- demand- led innovation fails- empirical studies prove

Grossman '9 (Peter Z. Grossman is the Clarence Efroymson Professor of Economics at Butler University. He thanks participants at the following events for helpful comments on earlier versions of this article: the Symposium on Bad Public Goods, the Searle Center, Northwestern University Law School; the Economic History Workshop, Northwestern University Department of Economics; and the Workshop in Political Theory and Policy Analysis, Indiana University Bloomington, "U.S. Energy Policy and the Presumption of Market Failure", Cato Journal, Vol. 29, No. 2 (Spring/Summer 2009), http://www.cato.org/pubs/journal/cj29n2/cj29n2-5.pdf, 2009)

Over the last 35 years, the U.S. government has embarked on several major projects to spur the commercial development of energy technologies intended to substitute for conventional energy resources, especially fossil fuels. Those efforts began with the 1973 energy crisis when President Nixon became the first U.S. leader to announce a plan for energy autarky. Presidents Ford and Carter followed Nixon's "Project Independence" with similar pledges. But beginning with Ford's 1975 energy act, plans for energy independence were tied directly to the development of new, alternative energy technologies. Under President Carter in particular, the federal government embarked on highly publicized, heavily funded efforts at developing new technologies with specific timetables for commercial entry and, in a few cases, a timetable for mass market substitution. Current mandates for ethanol and other biofuels fit this latter objective. The presumption underlying government alternative energy programs, including the ethanol program, is that voluntary market action is insufficient to develop new energy sources. Therefore, government has to step in to induce the technological development the market fails to create. Only through government intervention, according to this logic, can the market failure be corrected and the social benefits of alternative energy technologies be realized (Weimar and Vining 1992). **Whether a market failure has or has not existed with respect to alternative energy technologies, it is nonetheless relevant to ask whether the government's action creates a solution or a failure of its own.** The importance of government failure has been highlighted in recent years as government efforts in such diverse areas as inland waterway development, antitrust law, and public transportation appear to produce far more costs than benefits, and sometimes may worsen whatever market failures they were intended to correct (Winston 2006). 1 **The evidence suggests that with respect to alternative energy development, government failure has in fact been a more persistent and costly problem than market failure.** This article will argue that **government energy policy has been based on faulty premises not only about the existence of market failure but also about the nature and process of innovation**. Moreover, as this article will show, there is evidence that **the private sector can develop energy alternatives more efficiently than the government.** The article is organized as follows: first, I discuss the basic idea of market failure and how it has influenced U.S. energy policy. I also suggest that governmental solutions would have been unlikely to succeed even if a market failure had been correctly identified. Next, I focus on three efforts at government-directed innovation: synfuels, nuclear fusion electric generation, and the high-mileage automobile. All three were given significant funding and programmatic timetables with benchmarks of success. None of those timetables were met, few of the benchmarks were achieved, and development funds were largely wasted. Finally, I end with a discussion of how the federal government continues to pursue the same kinds of policies that offer the promise of more failure. The Market for Innovation: Market Failure or Government Failure? Ronald Coase (1964) argued that all forms of economic organization—markets, firms, and government—are "more or less failures." 1 Coase (1964) raised the issue of government failure. Wolf (1979) provides a theoretical foundation for "nonmarket" failures; Zerbe and McCurdy (2000) take issue with market failure as a justification for government intervention generally. 18485_CATO-R2(pps.):Layout 1 8/7/09 3:55 PM Page 296 That is, no real-world arrangement of economic institutions leads to ideal allocative or productive efficiency of the sort represented in the neoclassical model of perfect competition, which by definition allocates resources through markets so that there are no alternative arrangements that would lead to a higher level of social welfare. But since that model is based on unrealistic assumptions, Coase argued, it had to be assumed that all real-world markets fail to some extent, a point elaborated by Demsetz (1969). Of course, firms and government command systems clearly fail as well, and substituting command for markets does not guarantee success. The goal, Coase suggested, is to organize any particular type of economic activity using the form of organization that fails the least in a given situation. 2 Of course, one cannot know with certainty that one form of organization will fail less than another in a particular circumstance, although experience should provide some guidance. With respect to government energy development programs, there is 35 years of experience to draw on, but this history seems to be entirely ignored by decisionmakers in proposing new programs. How is it that the alternative energy market is presumed to fail? A new energy technology could potentially be worth billions of dollars, but an entrepreneur must bear a considerable development expense while his reward is uncertain. Of course, the greatest uncertainty is simply: Will the technology be marketable? But even if it is, the entrepreneur may be unable to keep others from cashing in on his efforts with competing products, and certainly he cannot gain some benefits that are attained by society as a whole. For example, a new technology might reduce the need for defense spending to protect oil supplies, but that benefit—while clearly substantial—cannot be captured by the entrepreneur who created the technology. The problem of uncertain or unattainable benefits but fully internalized

development costs means that entrepreneurs will be reluctant to invest in innovative energy technologies, which will consequently be undersupplied if left to the market alone (Arrow 1962). But even if this premise is accepted, it is not immediately clear what government can or should do to correct it. That is, with respect 2 Demsetz (1969) termed the comparison of ideal and real-world "institutional arrangements" the "nirvana approach." This is in contrast to the "comparative institution approach" that looks at alternative real-world arrangements to see which is "best able to cope" with a particular economic circumstance. to energy policy, what can government do that will lead to a successful new energy technology and not produce an even larger government failure? Policymakers have tried numerous schemes, some as low-cost and low-profile as simple information gathering. However, the most costly and the most visible by far have been efforts to induce innovation. Typically, policymakers have relied either on programs that provide incentives (usually tax preferences) to adopt a new technology or that undertake technology development directly. Neither of those types of programs has been successful, but the second, direct development, is especially problematic in principle as well as practice. **Government programs to create commercially viable alternative technologies of any kind rest on three implicit assumptions—all of them, at best, dubious. First, and perhaps most important, is that government must assume that innovation is a demand-side phenomenon**. U.S. energy **policymakers appear to believe that since consumers want alternative energy technologies**, someone should have built and marketed them. Since no one has, the assumption is that the market is failing to provide the incentives for innovators to act. **But the concept of demand-led innovation has very little empirical support**. In the 1960s, a few scholars—notably Jacob Schmookler (1966)—attempted to link the technological developments of the Industrial Revolution to a surge in demand. This theory seemed especially inviting at the time because it echoed the Keynesian demand-side perspective that dominated macroeconomic theory. But **the demand-side explanation has not survived careful analysis**. Today, **nearly all scholars agree that innovation is a supply-side phenomenon** (Mokyr 1977). As Nathan **Rosenberg** (1976), a leading economic historian of technology, **has argued**, scientific knowledge evolves if not randomly at least unevenly and its employment in marketable developments is certainly unpredictable and not necessarily consistent with consumers' desires at a given point in time. **The complexity of science makes it hard to foresee, much less to program, what kinds of new ideas can generate what kinds of new products. Only after technological developments occur, will entrepreneurs evaluate opportunities** for commercial development, and the verdict on whether they are right or wrong will be rendered in the marketplace. Though supply-side theories of innovation have had much more success in explaining technological development, **government alternative energy programs directed at correcting the market's failure to supply innovative products take for granted a demand-side explanation to the innovation process. Some experts argue that government can compel firms to innovate through the use of both incentives and disincentives**. In the literature, this concept is sometimes referred to as "technology forcing." The catalytic converter in cars is the example most frequently noted (Gerard and Lave 2003). Government commanded a reduction in automobile pollution and the converter resulted (albeit a few years later than mandated). But the converter was not intended to compete with an existing conventional technology as alternative energy technologies are expected to do. In fact, **there is simply no example of government "forcing" a commercially viable alternative energy product**.

AT: Government K2 Commercialization

Governments fail to commercialize technology

Grossman '9 (Peter Z. Grossman is the Clarence Efroymson Professor of Economics at Butler University. He thanks participants at the following events for helpful comments on earlier versions of this article: the Symposium on Bad Public Goods, the Searle Center, Northwestern University Law School; the Economic History Workshop, Northwestern University Department of Economics; and the Workshop in Political Theory and Policy Analysis, Indiana University Bloomington, "U.S. Energy Policy and the Presumption of Market Failure", Cato Journal, Vol. 29, No. 2 (Spring/Summer 2009), http://www.cato.org/pubs/journal/cj29n2/cj29n2-5.pdf, 2009)

The second assumption is that if a technology has been demonstrated to be possible, **government support will be needed to make it commercially viable**. **Exactly what this is based on is unclear. Government support is not by its nature designed to produce competitive market** results. Instead, as Public Choice theory explains, government intervention creates competition among entrepreneurs primarily to gain government support. In the very nature of the funding process, money for development will often go to the entrepreneur that (a) is most likely to meet political goals of legislators, and (b) does the best job of convincing government officials of the superiority of his approach. **Once support has been obtained**, the **entrepreneur has no need to work toward market competition and, in fact, has a great motivation to prevent market competition from arising.** Overall, **this situation provides more of an incentive for innovative rent seeking than for commercialization of innovative technologies** (Cohen and Noll 1991). The problem is not only how government dispenses support but also on what projects. **Technology policy implicitly proceeds from the assumption that** if there are competing technical ideas, **government bureaucrats are competent to choose the winner**. **But governments worldwide have overwhelmingly failed at this sort of task**. **In the1980s**, for example, **Japan** was touted as the model of successful government-led industrial policy. Of course, this assertion **was wrong in almost every respect, but it was most obviously off the mark with regard to the development of new technologies**. **Japanese technology policy was a fiasco. Decisionmakers backed** such **ideas** as an analog standard for HDTV and a so-called "next generation" computer, but **they produced no significant commercial products and wasted enormous resources** (Beltz 1993, Pollack 1992).

AT: Government Demonstration Spills Over

No spill-over from government demonstration- they over-estimate the speed of adoption- our turns happen first

Grossman '9 (Peter Z. Grossman is the Clarence Efroymson Professor of Economics at Butler University. He thanks participants at the following events for helpful comments on earlier versions of this article: the Symposium on Bad Public Goods, the Searle Center, Northwestern University Law School; the Economic History Workshop, Northwestern University Department of Economics; and the Workshop in Political Theory and Policy Analysis, Indiana University Bloomington, "U.S. Energy Policy and the Presumption of Market Failure", Cato Journal, Vol. 29, No. 2 (Spring/Summer 2009), http://www.cato.org/pubs/journal/cj29n2/cj29n2-5.pdf, 2009)

The third assumption in U.S. **technology policy is that if a technology is shown to be technically feasible** and appears cost competitive with a conventional resource, **rapid and widespread adoption will soon follow**. Put a bit differently, **the assumption is government backing will lead quickly to market domination**. In **general, there is no consideration given to the process of technological adoption and the nature of market behavior. This process unfolds over time. It can take decades for full market saturation to ensu**e. **Even when a technology seems** to offer **superior** benefits on some margins, **consumers may resist, preferring to wait until a technology is proven at least as reliable as—**and more desirable than—**the conventional product** it is to replace. For instance, compact florescent light bulbs save money in the long run versus the more familiar incandescent lights, but people resist them, it is thought, not only because of high consumer discount rates but also because of noticeable differences in the character of the light produced (Cole and Grossman 2004). In any case, **government energy programs** that typically include specific timetables for both the beginning and extent of market penetration necessarily **assume that when a product is ready for the market it will be consumed** (Cassedy and Grossman 1990). There is a way in which this outcome could be assured: Government could make a technology policy entirely coercive. By a given date people would have to adopt a technology or face fines or even imprisonment. 3 But most programs for alternative energy assume no coercion but rather a process by which market success simply occurs. Yet that process is unknown because, as the next section makes clear, **alternative energy programs have always (often dramatically) failed.** 3 That was in fact the case initially with California's zero emissions vehicle (ZEV) mandate, where automakers who failed to offer a sufficient percentage of ZEVs faced "stiff financial penalties" (Economist 1991), penalties that were not imposed when automakers failed to meet the mandate.

AT: Government Corrects Market Errors

Empirics prove the government doesn't remedy energy market errors- only a risk of our turns

Grossman '9 (Peter Z. Grossman is the Clarence Efroymson Professor of Economics at Butler University. He thanks participants at the following events for helpful comments on earlier versions of this article: the Symposium on Bad Public Goods, the Searle Center, Northwestern University Law School; the Economic History Workshop, Northwestern University Department of Economics; and the Workshop in Political Theory and Policy Analysis, Indiana University Bloomington, "U.S. Energy Policy and the Presumption of Market Failure", Cato Journal, Vol. 29, No. 2 (Spring/Summer 2009), http://www.cato.org/pubs/journal/cj29n2/cj29n2-5.pdf, 2009)

Market failure is in theory a plausible argument for government sponsorship of alternative energy technologies. But in practice, even where the argument would be strongest—for example, nuclear fusion—**there is little reason to believe that government programs actually have corrected the purported failures. One can certainly imagine the benefits that would result from successful development** of new technologies, **but history has demonstrated that government energy programs reach for more than they are ever likely achieve, and end up misallocating resources. This historical record is pertinent today**. Less than two years ago, an ethanol program was adopted that appears to embody all of the unfortunate characteristics of the programs for synfuels, fusion, and the high-mileage automobile. The program mandates technological progress according to a timetable with a goal of commercialization. The ethanol legislation, the Energy Independence and Security Act, as passed in late 2007 stipulates that by 2022 the United States will consume 36 billion gallons of ethanol annually, but to meet this goal there must be rapid commercialization of ethanol from cellulosic feedstocks. While the technology exists, it is not nearly cost competitive with conventional fossil fuel resources and requires breakthroughs of the type that stymied previous alternative energy efforts (Grossman 2008). And more of these sorts of policies seem likely in the years ahead. During his campaign for the presidency, Barack Obama called for production of 60 billion gallons of ethanol by 2030, 1 million plug-in hybrid cars on the road by 2015, and 25 percent of electricity from renewable sources by 2025. He vowed to spend $150 billion on new technologies despite the fact that government spending has never produced any viable alternative energy products. Faced with an economic recession, President Obama has focused mostly on the vacuous idea of "green jobs" (Morriss et al. 2009) while still pledging to spend $150 billion over 10 years to "transition to a clean energy economy" (White House 2009). But the grounds for these expenditures are no different from the ones that gave us the synfuels, fusion, ethanol, and PNGV programs. Government still believes that energy markets are deficient because they are not transitioning to "a clean energy economy" on their own. But **there is not the slightest reason to believe that that analysis is any more correct today than it has been for the last 35 years. Even if there is some sort of market imperfection, government is not likely to provide an improvement**. Indeed, **government failure, with its attendant waste of resources, seems certain to be the outcome**

Spending DA/ Net Benefit

2NC Government Spending Turn

government financial intervention causes corruption- generates dependency – instability- shifts private investment towards flawed programs- turns case

Loris and Spencer ’11 (Nicolas Loris and Jack Spencer, Nicolas D. Loris is a Policy Analyst and Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation, “Obama's Department of Energy Should Not Be the Green Banker”, http://www.thecuttingedgenews.com/index.php?article=52893pageid=16pagename=Opinion, October 11th 2011)

On July 14, 2011, **the Senate** Energy and Natural Resources Committee marked up the Clean Energy Financing Act of 2011 (S. 1510). The bill **would establish a federally owned, nonprofit Clean Energy Deployment Administration (CEDA) in the Department of Energy (DOE)** to support the deployment of politically defined clean technologies. **CEDA**, also **known as a “green bank,” is an outgrowth of the loan guarantee programs** of the Energy Policy Act of 2005 and the 2009 stimulus package. **It would provide government-backed low-interest loans,** credit enhancements, loan guarantees, and other financial mechanisms for certain energy and automotive projects that Washington deems worthy. President Barack Obama included a similar proposal for green projects in the infrastructure bank section of his American Jobs Act. However, while proponents call this “innovative financing,” **in reality it is a substantial and costly subsidy that invites unjustified government intervention into the private energy marketplace.** The Department of Energy has no business playing banker. **CEDA would redirect capital inefficiently and create a massive taxpayer liability.** CEDA: A Permanent Loan Guarantee Expansion When the federal government provides a loan guarantee, it enters into a contract with private creditors to assume the debt if the borrower defaults. According to the DOE, the purpose is to “allow the Federal Government to share some of the financial risks of projects that employ new technologies that are not yet supported in the commercial marketplace or where private tinvestment has been inhibited.” If a company defaults on a federally backed loan guarantee, the taxpayer is on the hook. This is not an appropriate role for the federal government. Two existing federal loan guarantee programs are of dubious value and have questionable objectives. Under Section 1703 of the Energy Policy Act of 2005, DOE has provided billions of dollars in loan guarantees for technologies that “avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases.” Section 1705 of the American Reinvestment and Recovery Act, more commonly known as the stimulus bill, added $8 billion to support additional loan guarantees, including funding for the scandalous Solyndra project. **CEDA would permanently extend** these **misguided policies by granting DOE unlimited authority to authorize loans without limiting the number of loans it can issue**. The initial capitalization or expenditure would be $10 billion, and the Congressional Budget Office (CBO) projects CEDA to cost an additional $1.1 billion over the next five years. Picking Losers Although the status of many loan guarantees is either conditional or recently closed, the first loans granted by DOE illustrate some of the problems with the program. **The solar company Solyndra received one of the first stimulus loan guarantees**—a $535 million loan. During a visit to the plant in 2010, President Obama said, “Companies like Solyndra are leading the way toward a brighter and more prosperous future.” In 2010, Solyndra closed one of its facilities and canceled its initial public offering. In August 2011Solyndra filed for Chapter 11 bankruptcy and laid off its 1,100 workers. The company is now under criminal and congressional investigations into how it secured the loan guarantee, and Solyndra owes the taxpayers $527 million. **Solyndra is not the only “green” company having financial troubles**. First Wind Holdings, another loan guarantee recipient, withdrew its initial public offering. In these instances, the reason for providing financing was unclear because they were not economically viable endeavors. **When the government makes decisions best left to the market, it increases the opportunity for and likelihood of crony capitalism, corruption, and waste. Loan guarantees artificially make** even **dubious projects appear more attractive and lower the risk of private investment**. For instance, private investors sunk $1.1 billion into Solyndra. Much of the private financing came after the Department of Energy announced Solyndra was one of 16 companies eligible for a loan guarantee in 2007. Private investors look at loan guarantees as a way to substantially reduce their risk. Even if a project seems to be a loser but has a huge upside (especially if complemented with other policies like a federal clean energy standard), private companies can invest a smaller amount if the government will back the loan. If the project fails, they still lose money, but the risk was worth it. **Without the loan guarantee, these projects would probably not have been pursued, and that is why they fail.** Subsidizing Winners In other cases, private financing was available so there was no need for preferential financing. For instance, Nordic Windpower received private funding in 2007, two years before the company received its loan guarantee. Google invested $100 million in Shepherds Flat Wind Farm. Although that investment was made after

the loan guarantee, Google determined it to be a worthwhile investment. If that is the case, then the project should not need a loan guarantee. **Even if a project with a federally backed loan is successful, attributing the project's success to the loan guarantee is a huge assumption**. **Venture capitalists** and other investors, who have much more expertise and knowledge than government bureaucrats in making investment decisions, **are in a better position to determine** which **ideas and businesses have the most potential. Without the loan guarantee, projects with the least promise would either not attract investment or simply fail, freeing capital for risky, but more promising ventures. In contrast, a government loan guarantee program ensures** that **the public pays for the failures while the private sector reaps the benefits** of any successes. **Loan Guarantees Distort the Market Proponents of loan guarantees** who argue that these programs come at minimal cost and are not subsidies **ignore the fact that CEDA loans cause the same harm as direct government subsidies by distorting normal market forces and encouraging dependence on the government. By subsidizing a portion** of the actual cost of a project through a loan guarantee, **the government is allocating resources away from more-valued uses to less-valued uses.** In essence, **these guarantees and loans direct labor and capital away from more competitive projects. A loan guarantee** program **signals** to the energy producer **that the project does not need to be competitive. Rather, the green bank simply has to like it. This reduces the incentive for the energy investor or business to manage risk, innovate, and increase efficiency, and it crowds out** other **innovative energy projects that do not receive loan guarantees.** While a **loan guarantee** or a below-market loan may be good for the near-term interests of the individual recipient, it is **not good** for taxpayers or **long-term competitiveness. Loan guarantees** also **encourage more government dependence**. If the government moves to more actively subsidizing clean energy technology through CEDA, investors will wait to determine who the government winners will be before they spend more of their own money on innovative ideas, expanding their businesses, or hiring more employees. As Darryl Siry, former head of marketing at Tesla Motors (a loan guarantee recipient), said, "**The existence of an 800-pound gorilla** putting massive capital behind select start-ups **is sucking the air away from the rest of the venture-capital ecosystem**…. Being anointed by DOE has become everything for companies looking to move ahead." Reshaping,

Economy Impact (Royal)

Global war – diversionary theory's true

Royal '10 – Director of Cooperative Threat Reduction at the U.S. Department of Defense (Jedediah, "Economic Integration, Economic Signaling and the Problem of Economic Crises," in Economics of War and Peace: Economic, Legal and Political Perspectives, ed. Goldsmith and Brauer, p. 213-215)

Less intuitive is how periods of **economic decline may increase the likelihood of external conflict**. Political science literature has contributed a moderate degree of attention to the impact of economic decline and the security and defence behaviour of interdependent states. Research in this vein has been considered at systemic, dyadic and national levels. Several notable contributions follow. First, on the systemic level, Pollins (2008) advances Modelski and Thompson's (1996) work on leadership cycle theory, finding that **rhythms in the global economy are associated with the rise and fall of a pre-eminent power and the** often **bloody transition from one pre-eminent leader to the next**. As such, exogenous shocks such as **economic crises could usher in a redistribution of relative power** (see also Gilpin. 1981) that leads to uncertainty about power balances, **increasing the risk of miscalculation** (Feaver, 1995). Alternatively, **even a relatively certain redistribution of power could lead to a permissive environment for conflict** as a rising power may seek to challenge a declining power (Werner. 1999). Separately, Pollins (1996) also shows that global economic cycles combined with parallel leadership cycles impact the likelihood of conflict among major, medium and small powers, although he suggests that the causes and connections between global economic conditions and security conditions remain unknown. Second, on a dyadic level, Copeland's (1996, 2000) theory of trade expectations suggests that '**future expectation of trade' is a significant variable in understanding economic conditions and security behaviour of states**. He argues that interdependent states are likely to gain pacific benefits from trade so long as they have an optimistic view of future trade relations. However, **if the expectations of future trade decline**, particularly for difficult to replace items such as energy resources, **the likelihood for conflict increases, as states will be inclined to use force to gain access to those resources**. **Crises could** potentially be the **trigger** for **decreased trade expectations** either on its own or because it triggers protectionist moves by interdependent states.4 Third, **others have considered the link between economic decline and external armed conflict at a national level. Blomberg and Hess** (2002) **find a strong correlation between internal conflict and external conflict**, **particularly during** periods of **economic downturn**. They write: The linkages between internal and external conflict and prosperity are strong and mutually reinforcing. Economic conflict tends to spawn internal conflict, which in turn returns the favour. Moreover, the **presence of a recession tends to amplify the extent to which international and external conflicts self-reinforce each other**. (Blomberg & Hess, 2002. p. 89) **Economic decline has** also **been linked with an increase in the likelihood of terrorism** (Blomberg, Hess, & Weerapana, 2004), which has the capacity to spill across borders and lead to external tensions. Furthermore, crises generally reduce the popularity of a sitting government. **"Diversionary theory" suggests** that, **when facing unpopularity arising from economic decline**, sitting **governments have increased incentives to fabricate external military conflicts** to create a 'rally around the flag' effect. Wang (1996), DeRouen (1995). and Blomberg, Hess, and Thacker (2006) find supporting evidence showing that economic decline and use of force are at least indirectly correlated. Gelpi (1997), Miller (1999), and Kisangani and Pickering (2009) suggest that **the tendency towards diversionary tactics are greater for democratic states** than autocratic states, due to the fact that democratic leaders are generally more susceptible to being removed from office due to lack of domestic support. DeRouen (2000) has provided **evidence show**ing that **periods of weak economic performance in the** United States, and thus weak Presidential popularity, **are statistically linked to an increase in the use of force.** In summary, recent economic scholarship positively correlates economic integration with an increase in the frequency of economic crises, whereas **political science scholarship links economic decline with external conflict at systemic, dyadic and national levels**.5 This implied connection between integration, crises and armed conflict has not featured prominently in the economic-security debate and deserves more attention. This observation is not contradictory to other **perspectives that link economic interdependence with a decrease in the likelihood of external conflict**, such as those mentioned in the first paragraph of this chapter. Those studies **tend to focus on dyadic interdependence instead of global interdependence and do not specifically consider the occurrence of and conditions created by economic crises**. As such, the view presented here should be considered ancillary to those views.

Government Implementation Fail Evidence (DOE Specific)

And- DOE implementation will cause the plan to fail- poor management and waste

Edwards '9 (Chris Edwards, Chris Edwards is the director of tax policy studies at Cato and editor of www.DownsizingGovernment.org. He is a top expert on federal and state tax and budget issues. Before joining Cato, Edwards was a senior economist on the congressional Joint Economic Committee, a manager with PricewaterhouseCoopers, and an economist with the Tax Foundation. Edwards has testified to Congress on fiscal issues many times, and his articles on tax and budget policies have appeared in the Washington Post, Wall Street Journal, and other major newspapers. He is the author of Downsizing the Federal Government and co-author of Global Tax Revolution. Edwards holds a B.A. and M.A. in economics, and he was a member of the Fiscal Future Commission of the National Academy of Sciences, "Energy Subsidies", http://www.downsizinggovernment.org/energy/subsidies, February 2009)

Overview **The energy industry has been heavily regulated and subsidized by the federal government for decades**. **The Department of Energy's** array of **subsidy programs grew out** of atomic research efforts **of the 1950s**, **responses to the energy crisis of the 1970s**, **and concerns about conservation and global warming in recent decades. The department spends about $9 billion annually on civilian energy research and subsidies. The following are some of the major program areas with the 2008 spending levels** listed: **Science. This $3.9 billion program area funds research on** such activities as high-energy physics**, nuclear physics, and fusion energy**. **Energy Efficiency and Renewables.** This $**1.5** billion program area **funds research into hydrogen power, solar power, wind power**, weatherization, vehicle technologies, **and other activities**. **Fossil Energy Research.** This $646 million program area funds research **into coal, oil, and natural gas technologies**. **Nuclear Energy**. This $**695 million** program area **funds** civilian **nuclear energy research**. **Electricity Delivery**. This $**157 million** program area **funds research into electricity transmission**. **Federal energy research should be phased-out as an unneeded cost in an era of massive government budget deficits**. **The private sector is entirely capable of performing research into coal, nuclear, solar, and alternative energy sources for itself**. Businesses will fund new technologies when there is a reasonable chance of commercial success, as they do in every other private industry. Federal subsidies may even be actively damaging to our energy future by steering markets in the wrong direction, away from the best long-term energy solutions. **Federal energy research has a poor track record**. **With regard to fossil fuels research**, for example, **the Congressional Budget Office has concluded**: **"Federal programs have had a long history of funding fossil-fuel technologies that**, although interesting technically, **had little chance of commercial implementation**. As a result, **much of the federal spending has not been productive**."1 That is a polite way of saying that **these programs have been a waste of taxpayer money. This essay discusses the record of waste and mismanagement in Department of Energy projects during recent decades**. **The number of major spending boondoggles in this department is remarkable.** The problem is that **departmental leaders and** members of **Congress have shown an unfortunate urge to** try and **centrally plan the energy sector**. But **they have been responsible for throwing tens of billions** of dollars **of taxpayer money down the drain on projects of little value**. **Policymakers** often **make grandiose promises**, such as proposing to make America "energy independent" or to convert the nation to a "green economy." **Those visions don't make any sense**, **but even if they did history shows that the Department of Energy would be incapable of putting them into place with any degree of competence**. **Federal energy schemes are** often **poorly**

managed and generate huge cost overruns, or they aim at objectives that make little economic sense, as the following case studies illustrate.

Error Replication Link

Turn- the affirmative's solvency advocate rely on a flawed understanding of economics – causes error replication

Gordon '8 (Richard L. Gordon is professor emeritus of mineral economics at the Pennsylvania State University, "The Case against Government Intervention in Energy Markets Revisited Once Again", No. 628 December 1, 2008)

Many politicians and pundits are panicked over the existing state of the oil and gasoline markets. **Disregarding past experience**, these **parties advocate massive intervention** in those markets, **which would** only serve to **repeat and extend** previous **errors**. These **interventionists propose solutions to nonexistent problems**. This Policy Analysis reviews the academic literature relevant to these matters and argues that **the prevailing policy proposals are premised on a misunderstanding of energy economics and market realities**. The **interventionists do not distinguish between problems that government can remedy and those that it cannot**. **They ignore lessons that should have been learned from past experience. They embrace at best second- and third-best remedies rather than first-best remedies** for the alleged problems. Moreover, **they ignore the extreme difficulty associated with ensuring efficient policy response even when it seems to be theoretically warranted**. Fear of oil imports is premised on pernicious myths that have long distorted energy policy. The U.S. defense posture probably would not be altered by reducing the extent to which oil is imported from troublesome regions. Fears about a near-term peak in global oil production are unwarranted, and government cannot help markets to respond properly even if the alarm proved correct. **Market actors will produce the capital necessary for needed investments; no "Marshall Plans" are necessary. Price signals will efficiently order consumer behavior; energy-consumption mandates are therefore both unwise and unnecessary**. Finally, more caution is needed regarding the case for public action to address global warming. The omnipresent calls for more aggressive energy diplomacy are misguided. Economic theory validated by historical experience implies that the diplomatic initiatives are exercises in futility because they seek to divert countries from the wealth maximization that is their goal. Similarly, the search for favorable access to crude oil is futile. Despite their popularity, rules to force reductions in energy use lack economic justification. Attacks on American oil companies and speculators seek to shift blame to those subject to U.S. government control from the uncontrollable foreign oil-producing governments that are truly to blame.

Picking Winners Link

The government fails at picking winners and losers- turns case

Green ’12 (Kenneth P. Green, Resident scholar at the American Enterprise Institute, “Government Is a Lousy Venture Capitalist”, http://www.american.com/archive/2012/february/government-is-a-lousy-venture-capitalist, February 24, 2012)

While **government** has a legitimate and valuable role in basic science, technology, engineering, and mathematics research, it **is a lousy venture capitalist and is largely incapable of picking winning technologies in the market.** In their article, “Lessons from the Shale Revolution,” Ted Nordhaus and Michael Shellenberger suggest that the success of hydraulic fracturing validates the idea that government “investment” is a reasonable and effective way to advance technology and to outperform market actors in finding and bringing cool new things to fruition. President Obama made the same argument in his 2012 State of the Union address, giving almost complete credit for hydraulic fracturing to Uncle Sam: The development of natural gas will create jobs and power trucks and factories that are cleaner and cheaper, proving that we don’t have to choose between our environment and our economy. And by the way, it was public research dollars, over the course of 30 years, that helped develop the technologies to extract all this natural gas out of shale rock–-reminding us that government support is critical in helping businesses get new energy ideas off the ground. Nordhaus and Shellenberger come down unequivocally on the president’s side of this argument: In fact, virtually all subsequent commercial fracturing technologies have been built upon the basic understanding of hydraulic fracturing first demonstrated by the Department of Energy in the 1970s. They also suggest that the same approach will foster the development of renewable energies such as wind and solar power: Indeed, once we acknowledge the shale gas case as a government success, not a failure, it offers a powerful basis for reforming present clean energy investments and subsidies. This argument is a direct contravention of the conventional wisdom that while government has a legitimate and valuable role in basic science, technology, engineering, and mathematics (STEM) research, it is a lousy venture capitalist and is largely incapable of picking winning technologies in the market. **Critics of the government’s claim of credit argue**, in essence, that **the government pulled a Ferris Bueller**: **They saw a parade** in progress, **hopped up on a float**, and **started singing** loudly and gesturing broadly. **Now, they claim credit for the entire parade. This is a fairly common practice**. Quite recently, President Obama claimed credit for increased oil and gas production in the United States, despite it being blatantly obvious that the increases came from state and private, not federal, lands. But for argument’s sake, let’s stipulate to the premise that hydraulic fracturing technology represents a great government success. What can we learn from this shining example? Not much, for two reasons: 1) **One winning game does not a champion make**. **Nordhaus** and Shellenberger take the **fracking example in isolation, and ignore persuasive literature showing that “industrial policy”** (**the formal term for government picking winners and losers**) **has a history of abject failure**. Some, such as Terence Kealey at the University of Buckingham, point out that **Japan’s efforts at industrial policy** (**through an agency called MITI**) **were simply a disaster**: **MITI**, far from being a uniquely brilliant leader of government/industrial partnership, **has been wrong so often that the Japanese themselves will concede that much of their growth derives from industry’s rejection of MITI guidance**. MITI, incredibly, opposed the development of the very areas where Japan has been successful: cars, electronics, and cameras. MITI has, moreover, poured vast funds into desperately wasteful projects. Thanks to MITI, Japan has a huge over-capacity in steel—no less than three times the national requirement. This, probably the most expensive mistake Japan ever made in peacetime, was a mistake of genius because Japan has no natural resources: it has to import everything; the iron ore, the coal, the gas, the limestone, and the oil to make its unwanted steel. (p.111) Kealey points to a comprehensive study of MITI interventions between 1955 and 1990, observing that: Richard Beason of Alberta University and David Weinterin of Harvard showed that, across the 13 major sectors of the economy, surveying hundreds of different companies, Japan’s bureaucrats almost invariably picked and supported the losers. (p.111) As Obama’s own economic adviser Larry Summers pointed out, **the government is a bad venture capitalist**. **It has no greater ability to pick winners than does any private individual**, **but it can be far more reckless in its “investments” because there is no penalty for wasting money**, and because it can use state force to favor cronies and rig outcomes. Sure, the government invested in hydraulic fracturing, but were their investments key to its success, or are they simply claiming credit for an accidental situation where something went right? Based on the evidence, the latter is more likely than the former.

Cronyism Link

Turn- Cronyism- the plan causes corruption- trades-off with competition

Boskin ’12 (Michael J. Boskin, a professor of economics at Stanford and a senior fellow at the Hoover Institution, serves on the board of directors of Exxon Mobil Corp. He chaired the Council of Economic Advisers under President George H.W. Bush, “Washington's Knack for Picking Losers”, http://online.wsj.com/article/SB10001424052970204883304577221630318169656.html, February 15, 2012)

Like the mythical monster Hydra—who grew two heads every time Hercules cut one off—President **Obama**, in both his State of the Union address and his new budget, **has** defiantly **doubled down on his brand of industrial policy**, **the usually ill-advised attempt by governments to promote particular industries, companies and technologies at the expense of broad, evenhanded competition. Despite his record of picking losers**—**witness** the failed "clean energy" projects **Solyndra**, **Ener1 and Beacon Power**—Mr. Obama **appears determined to continue pushing** his brew **of** federal **spending**, regulations, mandates, special waivers, **loan guarantees**, **subsidies and tax breaks** for companies he deems worthy. Favoring key constituencies with taxpayer money appeals to politicians, who can claim to be helping the overall economy, but **it usually does far more harm than good**. **It crowds out valuable competing investment efforts financed by private investors, and it warps decisions by bureaucratic diktats susceptible to** political **cronyism**. **Former** Obama **adviser** Larry **Summers echoed most economists' view when he warned the administration against federal loan guarantees** to Solyndra, **writing** in a 2009 email that "**the government is a crappy venture capitalist." Markets function well when the returns are received and the risks borne by private owners**. There are, of course, exceptions: Governments have a responsibility to fund defense R&D and other forms of pre-competitive, generic R&D—e.g., basic science and technology from nanoscience to batteries—but only when they pass rigorous cost-benefit tests and maintain a level playing field among alternative commercial applications. For example, the computer-linking technology that created the Internet was funded by the Defense Department for defense purposes. But, like numerous defense technologies, it wound up with commercially valuable civilian applications. Yet it would be foolish for the government to subsidize a particular search engine or social-networking platform. The previous peak for U.S. industrial policy was in the 1970s and 1980s, when many Democrats wanted to emulate the then-growing Japanese economy by managing trade and directing specific technology and investment outcomes. Japanese subsidies mostly went to old industries like agriculture, mining and heavy manufacturing. We now know that this **misallocation of capital was one of the main reasons for Japan's stagnation over the past two decades**. Enlarge Image Martin Kozlowski Industrial-policy fever waned after the 1980s but never died. President George W. Bush expanded ethanol mandates and pushed hydrogen cars. Hydrogen's use for transportation must still overcome combustibility concerns, or we'll be driving mini-Hindenburgs. The Bush and Obama administrations bet big on ethanol and other biofuels, providing subsidies that distorted the global market for corn. The federal government was forced to drop its cellulosic ethanol quota by 97% last year because of a lack of viable biorefineries—and the quota still wasn't met. **Even under optimistic projections, heavily subsidized wind and solar would each amount to a tiny fraction of global energy by 2030** and thus cannot be the main answer to energy-security or environmental problems. **The short-run focus of most Department of Energy funding misses the main strategic imperative:** We need alternatives that can scale to significance long-term without subsidies, and we need a lot more North American oil and gas in the meantime. Mr. Obama is spending immense sums for subsidies to particular industries and technologies, almost $40 billion for clean-energy programs alone (some, appropriately, for pre-competitive generic technology.) Yet **a large number of prominent venture-capital funds are devoted to alternative-energy providers**. **They should be competing with each other and with the technologies they seek to replace—not for government handouts.** Meanwhile, the administration blocks shovel-ready private investment such as the Keystone XL pipeline from Canada to the Gulf Coast, which would create thousands of American jobs, increase energy security, and even improve the environment. The alternative is shipping the Canadian oil to China; we can refine it more cleanly than the Chinese, and pipelines are safer than shipping. America certainly has energy-security and possible environmental concerns that merit diversifying energy sources. More domestic oil and natural gas production will clearly play a large role. The shale gas hydraulic fracturing revolution—credit due to Halliburton and Mitchell Energy; the government's role was minor—is rapidly providing a piece of the intermediate-term solution. The **arguments to promote industrial policy**—incubating industries, benefits of clustering and learning, more jobs, etc.—**don't stand up to scrutiny**. **Echoing 1980s Japan-fear and envy**, some claim we must enact industrial policies

because China does. We should remember that Presidents Lyndon Johnson and Richard Nixon wanted the U.S. to build a supersonic transport (SST) plane because the British and French were doing so. The troubled Concorde was famously shut down after a quarter-century of subsidized travel for wealthy tourists and Wall Street types.

Displacement Link

Turn- displacement- The aff causes a net trades-off with private capital- kills investment

Green '12 (Kenneth P. Green, Resident scholar at the American Enterprise Institute, "Government Is a Lousy Venture Capitalist", http://www.american.com/archive/2012/february/government-is-a-lousy-venture-capitalist, February 24, 2012)

2) **Displacement is not addition**. Studies show that **government "investment" in applied research and development does not add new money to the pot**, **it displaces private capital, and does so disproportionally**. **When government steps in, it displaces more money than it throws in the pot.** Again, Kealey sums it up well using a study by the OECD: Furthermore, **regressions including separate variables for business-performed R&D** and that performed by other institutions (mainly public research institutes) **suggest that it is the former that drives the positive association between total R&D intensity and output growth**… **The negative results for public R&D are surprising and deserve some qualification**. Taken at face value, they suggest **publicly performed R&D crowds out resources that could be alternatively used by the private sector, including private R&D**. There is some evidence of this effect in studies that have looked in detail at the role of different forms of R&D and the interaction between them. (p.19) Kealey's own research agrees: Moreover, **the OECD does not stand alone**: **at least two other researchers, Walter Park of the Department of Economics at the American University at Washington, D.C**., and myself, **have found**—by similar surveys of OECD data—**similarly damaging effects of the government funding of research and development.** Government, like a really bad surgeon, sings the praises of patients it heals and buries those it mangles, quietly when it can, and loudly blaming others when it can't. As Frédéric Bastiat explained some 150 years ago, economic actions have both seen and unseen consequences. Fans of industrial policy are keen to point out the seen, and never countenance the unseen waste and opportunity costs. I gladly walk with Nordhaus and Schellenberger when they argue that supporting basic research in STEM fields is a valid, important, and often beneficial governmental activity. However, **we fall out of step when they start endorsing industrial policy and having bureaucrats pick winners and losers in the market**.

Established Companies Link

Turn- Government funds go to established companies- causes cronyism- props up inefficiencies- stifles new innovation

DeHaven '12 (Ted DeHaven, Tad DeHaven is a budget analyst on federal and state budget issues for the Cato Institute. Previously he was a deputy director of the Indiana Office of Management and Budget. DeHaven also worked as a budget policy advisor to Senators Jeff Sessions (R-AL) and Tom Coburn (R-OK). In 2010, he was named to Florida Governor Rick Scott's Economic Advisory Council. His articles have been published in the Washington Post, Washington Times, New York Post, Wall Street Journal Online, National Review and Politico.com. He has appeared on the CBS Evening News, CNBC, Fox News Channel, Fox Business Channel, and NPR, "Political Support for Energy's Loan Guarantees", http://www.downsizinggovernment.org/political-support-energy%E2%80%99s-loan-guarantees, June 26, 2012)

Several weeks ago, 127 House Republicans joined 155 Democrats to defeat an amendment introduced by Rep. Dennis Kucinich (D-OH) and Rep. Tom McClintock (R-CA) that would have shut down the Department of Energy's Title 17 loan guarantee program. That's the program that gave birth to Solyndra, which has come to symbolize the failure of the Obama administration's crony capitalist policies. Why would members of Congress, and Republicans in particular, continue to support this federal boondoggle incubator**? A new paper from Cato adjunct scholar Veronique de Rugy that looks at the Energy loan guarantees explains: One reason is it serves three powerful constituencies**: lawmakers, bankers, and the companies that receive the subsidized loans. **Politicians are able to use loan programs to reward interest groups while hiding the costs**. **Congress can approve billions of dollars** in loan guarantees **with little or no impact to the appropriations or deficit because they are almost entirely off-budget**. Moreover, unlike the Solyndra case, **most failures take years to occur**, **allowing politicians to collect the rewards of granting a loan** to a special interest **while skirting political blame years later when or if the project defaults**. **It's like buying a house on credit without having a trace of the transaction on your credit report.** Veronique notes that **most of the money for the loan guarantees** issued under section 1705 of Title 17 **have gone to large and established companies: These include established utility firms, large multinational manufacturers, and a global real estate investment fund.** In addition, the data shows that **nearly 90 percent of the loans guaranteed by the federal government since 2009 went to subsidize lower-risk power plants**, **which in many cases were backed by big companies with vast resources**. This includes loans such as the $90 million guarantee granted to Cogentrix, a subsidiary of Goldman Sachs. Currently, Goldman Sachs ranks number 80 on the list of America's Fortune 500 companies. In recent testimony before the House Budget Committee, Chris Edwards and I also discussed the crony nature of the president's "green" energy subsidies: President **Obama's green energy programs illustrate how corporate welfare creates corrupting relationships between businesses and politicians.** The Washington Post found that **"$3.9 billion in** federal [energy] **grants and financing flowed to** 21 **companies backed by firms with connections to** five **Obama** administration **staffers and advisers**." It also noted that the "main players in the Solyndra saga were interconnected in many ways, as investors enjoyed access to the White House and the Energy Department." According to the New York Times, Solyndra "spent nearly $1.8 million on Washington lobbyists, employing six firms with ties to members of Congress and officials of the Obama White House." American businesses, of course, have a right to lobby the federal government. But given that reality, **Congress throws fuel onto the corruption fire by creating business subsidy programs. When subsidy money flows out the door from Washington to businesses at the same time that money flows back from businesses to Washington for lobbying**, **it's no surprise that we get influence-peddling. Corporate welfare undermines honest and transparent governance**, and Americans are sick and tired of the inevitable scandals. Unfortunately, most members of Congress apparently aren't sick and tired of it.

Bubble DA/ Net Benefit

2NC Bubble Turn Overview

The plan generates a bubble through artificial injection of capital into X industry- causes a worse collapse- Europe proves

And even if they initially succeed- it still generates a longer-term bubble- supercharges the collapse

Loris and Spencer '11 (Nicolas Loris and Jack Spencer, Nicolas D. Loris is a Policy Analyst and Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation, "Obama's Department of Energy Should Not Be the Green Banker", http://www.thecuttingedgenews.com/index.php?article=52893pageid=16pagename=Opinion, October 11th 2011)

Not Stimulating, the Economy The CBO's cost estimate for CEDA notes that funding would be available for "energy, transportation, manufacturing, commodities, residential, commercial, municipal, and other sectors of the economy." Expanding the list of potential recipients to include coal with carbon capture and sequestration, natural gas vehicles, and energy efficiency technologies would not make the green bank acceptable. It would simply expand the green bank's potential to distort more sectors of the economy with subsidized financing. **As** the **subsidies are removed from these green energy industries**, **they collapse because they were developed in a bubble** in **which market demand and price signals were muted. The European experience with** subsidizing **renewable energy is a perfect example**. **This inevitable confrontation with reality demonstrated** that **the industry lacks the tools to survive unaided**. When faced with a need for drastic budget cuts and job creation, **Spain, the United Kingdom, Germany, France, and the Czech Republic decided to reduce subsidies for green energy programs, such as wind and solar energy**. As a result, **some industries have collapsed and others are either collapsing or face difficult roads ahead.** Although each European country has taken a different approach to subsidize green technologies, **the results have been the same: Artificially propping up industries by reallocating labor and capital toward uncompetitive projects**, forcing higher energy prices on ratepayers, **and failing projects are costly to the economy and the taxpayer.** Protecting Taxpayers and the Economy Congress should resist the temptation to distort the energy market even further. Specifically, Congress should refuse to expand loan guarantee programs or to implement any new capital subsidy programs, whether through CEDA or the infrastructure bank. American taxpayers cannot afford these programs, and they would put taxpayers on the hook for an untold number of projects that could fail. **Even if the selected projects succeed, such programs give preferential treatment to those companies lucky enough to receive a loan guarantee from the government and increase the opportunity for and likelihood of fraud and corruption.** The government needs to stop trying to pick winners and losers in the marketplace.

And green bubble collapse spills over to other sectors- tanks the economy

Ruppert '10 (Michael C. Ruppert is an American author, a former Los Angeles Police Department officer, and investigative journalist and peak oil advocate, "Michael Ruppert: "Beware the Green Investment Bubble", http://www.chelseagreen.com/content/michael-ruppert-beware-the-green-investment-bubble/, April 11, 2010)

The following is an excerpt from Confronting Collapse: The Crisis of Energy and Money in a Post Peak Oil World by Michael C. Ruppert. It has been adapted for the Web. There is much popular talk about the coming new Green Economy; about how America will rebuild itself to new and undreamed-of prosperity by building an economy based on alternative, carbon-free or low-carbon energies. We have already seen how problematic some alternative energy sources are, but that's only half of the problem. The other half is the fact that all these green energy companies are going to issue stock, borrow money and commit themselves to endless growth because they will function in the same economic paradigm that governs everything else. They're screwed before they even get out of the gate, especially for the brief interval where oil will stay

below $100. In the Peak Oil movement we have called this "The Bumpy Plateau" for more than a decade. Any attempt at economic recovery will result in an immediate oil price spike in the face of depletion, which will kill the recovery and take another, deeper bite out of what was left when the recovery started. **It would be unwise to instantly forget what happened with the dot-com and housing bubbles**. **Both were illusions and well-orchestrated wealth transfers** from the middle and lower classes to the wealthiest people in the country. The housing bubble was created and fanned white-hot by intentionally deregulating the mortgage industry, fraud and a host of crimes which sucked people into buying homes they could not afford and could never hope to pay for. A ton of money was created and it went to the people who ran the schemes: the largest banks, mortgage lenders and political campaign donors. **When that bubble collapsed, the taxpayers were asked to bail out first** Bear Stearns and then Fannie Mae and Freddie Mac **at total costs that will top $1 trillion dollars** before counting the October 2008 bailout of $800 billion and all those that followed under many deliberately confusing names into the first quarter of 2009. As I write, the total "value" of various U.S. government bailouts has topped $10 trillion. **This doesn't count the U.S. banks that have failed and are going to fail before banks are inevitably nationalized**. **Those are the same banks where green energy companies will be forced to look for financing**. Personally, I think that the sooner the big banks fail, the sooner people can get to devising local currencies, which is what they'll need to survive anyway. It is imperative to start that process while bridges are still standing and fresh water still runs. We need to start the transition to local currencies while there is still electricity and while fiber-optic cables are maintained and relatively new; while airlines fly and cell phones operate. None of the above takes into account all the cash that homebuyers put into down payments initially. That money was lost too. That's the same thing as the money that gullible investors poured into the dot-com bubble. The ones at the bottom of the pyramid are always us, and it is always our money that disappears first. The current monetary paradigm offers no other option. The above does not address the equity (energy) that was lost in each collapse. These are real costs. **In the market crash of 2002 and 2003** (which I accurately predicted, saying it was only a precursor to today's events) **hundreds of billions of dollars of shareholder equity were destroyed by the fraud of major corporations. Those** dollars represented a lot more energy than what circulates today. The Federal Reserve has doubled its capitalization in less than a year, having left it alone for the previous nine decades. The equity was destroyed, but the wealth was transferred. And equity is where wealth resides in the dying economic paradigm. There may be 40% less equity in the Dow Jones than there was in late 2007, but there is more equity that has been hidden and disguised by those who hold it. But even wealth transfers have a law of entropy. This is not a case where all those investments were converted 1:1 into some other form. The elites who thought they were immune are going down too, like dinosaurs who cannot grasp their impending extinction. Even the Oracle of Omaha, Warren Buffet, has discovered himself mortal. As the networks blithely talked about shareholder equity that was lost at the beginning of the collapse, **they almost never mentioned how many billions of dollars pension funds, other institutional investors and individuals put back in to the markets when they bought more shares at newly lowered prices. When bubbles burst, those on the bottom literally pay twice**. The first time, when they buy stocks that later tank, and again when they purchase new shares, hoping to make up for the equity they lost when the previous bubble burst. Does this sound like an out-of-control gambling addiction to you? **What happened was that the people at the top got "their" money out, at the top. They sold their shares before the bubble burst. That's why they call it "pump and dump."** **An American president cannot let this happen with a "Green Economy" for three reasons**. First, **the Treasury is empty and the United States now has its largest budget deficit ever,** with the national debt exceeding $11 trillion. **It doesn't have many bailouts left**, **and these do absolutely nothing to solve the fundamental problem. They only impair the system's ability to respond to new challenges**, like feeding you when the time comes. **Second, the infrastructure costs to assist in some kind of stable transition and to maintain basic services as oil and gas fade away are going to be astronomical. Third, the Green Economy has got to produce and deliver useable solutions quickly**. **We cannot afford energy bridges to nowhere that make great profit for investors but provide little or no real-world benefit. If** the Green Economy doesn't do this, then the nation will be left with a non-functioning energy infrastructure. Beware of Greenwash hype. A new level of oversight by the Securities and Exchange Commission (SEC), managed directly by the White House, is going to be essential. There will need to be the equivalent of a Good Housekeeping Seal of Approval for alternative energy companies which says that what they are selling will actually work. We know what to look for. The financial folks who will organize and fund the Green Economy will—as a matter of course—be of the same discipline, with the same priorities, trying to meet the same requirements as the folks who gave us Enron, WorldCom, Tyco, Bear Stearns, Fannie Mae, Freddie Mac, Lehman Brothers, Citigroup, AIG, and Washington Mutual. If the Green Economy is to be any real help, it must have, as its only mandate, the development and delivery of alternative energy supplies and infrastructure and getting it to the American people in an efficient and speedy manner. This will require a fundamental change in the way money works, and it will be directly addressed in the proposed policies which follow.

Bubble Turns Alt. Energy

Bubble collapse turns case- causes alt energy companies to move and collapses government support- Spain proves

Boccia '12 (Romina Boccia, Policy analyst at the Independent Women's Forum specializing in education, regulation, and economics, "Spain's Top Five Renewable Energy Waste Examples: A Lesson for the U.S.", http://blog.heritage.org/2012/05/31/spains-top-five-renewable-energy-waste-examples-a-lesson-for-the-u-s/, May 31, 2012)

With **Spain's lavish support for renewable energy projects drying out**, **companies that relied on these government handouts to make a buck are either leaving the country** in search of new misguided benefactors **or risking going bust**. According to Bloomberg: **Spanish renewable-energy companies that once got Europe's biggest subsidies are deserting the nation after the government shut off aid**, pushing project developers and equipment-makers to work abroad or perish. Saddled with a budget deficit more than twice the European Union limit and a ballooning gap between income and costs in its power system, Spain halted subsidies for new renewable-energy projects in January. Spain's attempt to outdo even Germany's lavish support for the renewable energy industry ran up against some hard and fast economic rules. Here are five points to put Spain's renewable waste in perspective: In 2007, a Spanish law granted 444 euros ($556) per megawatt-hour for home rooftop solar panels feeding the power grid, compared with an average 39 euros paid to competing coal- or gas-fired power plants. By 2009, the consumer bill for clean-energy aid had risen to 6 billion euros a year, ahead of the 5.6 billion euros in Germany, whose economy is almost four times bigger, according to the Council of European Energy Regulators. Solar energy was the biggest drag on the system, accounting for almost half of the annual 6 billion euros of liabilities and producing just above 2 percent of the power. Spain's peak electricity demand (44 gigawatts) is less than half of capacity (99 gigawatts). Spain's power-system debt swelled to 23 billion euros as successive governments set electricity prices for consumers that didn't cover the revenue that utilities booked. Also noteworthy is that, whereas Spain was following the German renewable subsidy model in structuring its government support for wind and solar energy, Germany is now following Spain's lead in cutting back on this unsustainable industrial policy. **The bust we're seeing today, in what amounted to a renewable energy bubble fueled by reckless government policies, should come as no surprise. The concentrated picking of winners and losers in the marketplace** by government **is inherently inferior to the decision-making of** dispersed **consumers**. The process for the so-called renewable energies to become viable is through innovation based on competition and consumer choice, not through government favoritism. **The U.S. should heed Europe's lesson and remove subsidies and other forms of support for all energy sources to allow for a robust energy market in** which energy providers compete on the value they create for consumers. **This would encourage more energy innovation and provide the competitive environment to make energy more abundant and affordable.** Congress and the President could do yet more by reducing overly onerous regulatory burdens and allowing for more access to energy resources on federal lands and offshore. Heritage's Nick Loris lays out in four clear points why President Obama's current policy—to push energy subsidies—is wasteful and economically destructive. Subsidies (1) destroy jobs elsewhere in the economy, (2) promote crony capitalism, (3) create industry dependence on government, and (4) waste taxpayer dollars.

Turns Foreign Policy Impacts

And bubble collapse turns America's foreign policy agenda- turns their X impacts

Victor and Yanosek '11 - professor at the School of International Relations and Pacific Studies; AND*** Yanosek – MBA from Harvard (Victor, David G. Yanosek, Kassia. "The Crisis in Clean Energy: Stark Realities of the Renewables Craze". August, 2011. Proquest)

After years of staggering growth, **the clean-energy industry is headed for a crisis**. In most of the Western countries leading the industry, the **public subsidies** that have propelled it to 25 percent annual growth rates in recent years **have now become politically unsustainable**. Temporary government stimulus programs-which in 2010 supplied one-fifth of the record investment in clean energy worldwide-have merely delayed the bad news. Last year, after 20 years of growth, the number of new wind turbine installations dropped for the first time; in the United States, the figure fell by as much as half. **The market value of leading clean-energy equipment manufacturing companies has plummeted and is poised to decline further** as government support for the industry erodes. **The coming crisis could make** some of **the toughest foreign policy challenges facing the United States-from energy insecurity to the trade deficit to global warming-even more difficult to resolve. The revolution in clean energy was supposed to help fix these problems while also creating green jobs that would power the economic recovery**. Some niches in clean energy will still be profitable, such as residential rooftop solar installations and biofuel made from Brazilian sugar cane, which is already competitive with oil. But overall, the picture is grim. This is true not only for the United States but also for the rest of the world, because the market for clean-energy technologies is global.

Futures Market Links

Government subsidies distort speculative investors- disrupt financial energy markets

Spence and Prentice '12 (David B. Spence: Associate Professor of Law, Politics, and Regulation, McCombs School of Business,
University of Texas at Austin, and Professor of Law, University of Texas at Austin, Robert Prentice: Ed and Molly Smith Professor of Business Law, McCombs School of Business, University of Texas at Austin, Boston College Law Review,
Volume 53 | Issue 1 Article, "The Transformation of American Energy Markets and the Problem of Market Power", http://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=3184&context=bclr, January 1, 2012)

Putting aside the presence of local opposition or regulatory barriers to entry, construction of new generating capacity is a complicated business proposition, one fraught with what investors call "political risk." **Virtually every segment of the industry faces the possibility of regulatory change that could alter market fundamentals**. **Government provides** a bewildering array of **subsidies and assistance to virtually every fuel source** used to generate electricity.326 And, **these programs come and go quickly**,327 **which makes it difficult for prospective investors** in new capacity **to be sure that their plants will be cost competitive compared** to those of their current and **future competitors**. Nor is the demand side of the equation much more certain. **New programs** designed to promote energy efficiency, for example, **could reduce demand** for electricity by more than twenty percent, if implemented.328 **All of this uncertainty can make it exceptionally difficult for a prospective developer** of a new generating plant **to estimate future project revenues**. **The prospective generator may face the prospect of selling all of its energy in a spot market, and may be cost-competitive in that market only during periods of peak demand**. In that case, it may need peak rates to be higher than the FERC-imposed mitigation rate cap, even if that cap provides excessive scarcity rents to existing sellers.

Energy market instability causes energy price spikes and volatility- generates larger bubbles- turns case

Krapels '7 (Edward N. Krapels, Special Advisor Financial Energy Markets Energy Security Analysis, Inc. Wakefield, Massachusetts, "Testimony Before a Joint Heating of the U.S. Senate Permanent Subcommittee on Investigations of the Committee on Homeland Security and The Governmental Affairs and the Subcommittee on Energy of the Committee on Energy and Natural Resources", "Financial Energy Markets and the Bubble in Energy Prices: Does the Increase in Energy Trading By Index And Hedge Funds Affect Energy Prices?", December 11, 2007)

BACKGROUND: THE "FINANCIALIZATION" OF ENERGY MARKETS Do **financial energy markets affect the level and the volatility of oil and gas prices**? **We use the term "financial energy markets" here to mean the collective of trading arenas in which forward energy prices evolve from trades on** (1) **formal traditional exchanges** (notably the New York Mercantile Exchange), (2) new forms of exchanges that combine traditional and over-the-counter transactions (notably, the Intercontinental Exchange), and (3) bilateral energy contracts whose prices are indexed to those of the exchanges. Discussions within the oil and finance community reflect various perspectives on this issue. The discussions raise a very important question: **did the increase in oil prices to almost $100/barrel and natural gas prices above $10 per MMBTU in 2006 and 2007 reflect classic commodity "bubbles" in which financial markets played a distinct**, sui **generis role** ; or a "new regime" of permanently higher prices brought about by sharp increases in demand and enduring changes in supply, which pushed both crude oil and natural gas into suddenly much higher marginal production costs? As always, the answers are not mutually

exclusive. We may be living in a period when there has been a "perfect storm" of conditions conducive to higher energy prices. This is obviously an enormously complication question. The number of dollars involved in energy futures and over the counter markets (collectively, the energy derivatives markets) is measured in the hundreds of billions. The physical oil market is global in scale, and information about global oil stocks and flows is notoriously incomplete. The flow of investor funds into commodities; into the fuels segment of commodities; into individual fuels; and from the long to the short side of particular markets is also immense and has been growing rapidly in the last five years. The question the House and Senate committees are exploring this week is whether the increase in the volume and open interest in oil and gas derivatives markets has a significant impact on world crude oil and petroleum product prices, and on U.S. natural gas prices. I believe this is likely to be one of those questions that – to use Gregory Treverton's useful distinction -- is a mystery, rather than merely a puzzle. In their formal capacities, economists are trained to treat problems as puzzles, amenable to rational analysis. That requires enough information to move the problem from the mists of mystery to the brighter lights of puzzles. There are reasons to believe that condition does not exist, yet, in this case. **How do financial energy market activities influence energy prices?** In articles I have published on this issue , **I have compared the "flow of funds" of the magnitude we are seeing today to a new wave of buyers and sellers interested in oil and gas. Could that flow have created a "bubble" in oil and gas prices in 2005, 2006 and 2007? Examples of such bubbles abound**. From Dutch tulip markets in the 1600s to Internet equities in the 2000s and the subprime mortgage crisis today, asset classes routinely go through booms and busts created – **not by any change in the costs of production** or technological change in the value added by consumption – **but purely by virtue of a change in investors' desire to own the asset.** There were forward and derivative instruments in oil markets as far back as the 1860s, but they were not as ubiquitous and as easy to use as those available today. Before the advent of modern financial markets, the desire to own oil could manifest itself in only limited ways. One could hoard physical barrels of oil, put them in storage, and sell them at a later date (at a profit or a loss). Or, one could buy the equity or debt instruments of oil producing companies. Beginning in the 1980s, the emergence of a viable and liquid futures market for oil made it much easier for investors and traders to deal in the commodity: they could buy or sell contracts, settled by an Exchange. U.S. natural gas followed suit in the early 1990s**. Like any other futures market, the oil and gas futures markets allow one class of participants to hedge, and another class of participants to speculate.** Speculators play an important role: they allow hedgers to put aside the risk of commodity price fluctuations to others better able or more willing to live with them. Oil and gas producers and consumers are hedgers, small traders and larger financial institutions, like hedge and private equity funds, some investment banks, and specialized energy trading outfits, are speculators. Even though many crude oil and natural gas producers, oil refiners, and petroleum product and natural gas consumers do not hedge, the fact remains that New York Mercantile Exchange (NYMEX)-traded West Texas Intermediate (WTI) crude oil and Intercontinental Exchange (ICE) –traded Brent crude oil, American and European heating oil and gasoline, and U.S. natural gas contracts have become benchmarks of both physical commodities and financial assets whose price fluctuations affect the economics of the entire energy industry as well as those buying services from that industry. Thus, even purely commercial participants in oil and gas markets are just as affected by the force of financial energy markets as are the speculators and hedgers that use them every day. Beginning in the 1990s, some participants in oil and gas markets began to suspect that the trading behavior of institutional speculators was influencing prices. These speculative organizations had been minor participants in the financial oil markets since the crude oil contract was launched in 1984. By the mid-1990s, however, the number of financial investors trading crude oil contracts began to increase rapidly. The increase was not confined to oil: to the contrary, one can only understand the phenomenon, and how to deal with it, if one understands the larger investment picture in global financial markets. With the wide array of contracts and assorted rules on leveraging trades, international financial markets have become extremely complicated. In every economy, wealth is held in the form of land, precious metals, goods, and financial instruments like stocks, bonds, currency holdings, and futures contracts. The stock of wealth, on a global scale, has to be tallied in the hundreds of trillions of dollars. The largest shares are in the United States, Japan, and Western Europe. If the stock of global wealth can be measured in the hundreds of trillions of dollars, the flow of funds – which no single institution measures systematically – amounts to several trillions of dollars over the course of a year. Thus, a Japanese investor may sell his real estate in Tokyo in order to buy stocks in Malaysia, or U.S. Treasury Bills, or crude oil futures contracts, or a trunkful of gold or silver. He may also deposit his funds in a bank, which then makes loans, engages in swaps, and sells futures and options in the over the counter markets. This intricate web of investments, loans, and derivatives has grown exponentially over the last ten years. Parts of this web are always under some pressure. There is almost always a small meltdown or bubble somewhere. In 1998 and 1999, the meltdowns were very large indeed. Asian equity, real estate, and currency markets collapsed. In 2001, the meltdown occurred in U.S. and global equity markets in the spring of 2000. Meltdowns can happen anywhere. In late September 1998, reports began to circulate of a successful effort by the New York Federal Reserve Bank to orchestrate a $3.5 billion bailout of a hedge fund (Long Term Capital). According to new reports, "Wall Street's biggest power brokers agreed to prop up one of their most aggressive offspring, Long-Term Capital Management, L.P., a highflying hedge fund that was on the verge of collapse." According to the Wall Street Journal, one of the "hotly debated topics" in the meeting that reached the accord to bail out the Fund was that its failure "would put the entire financial system at risk" because the Long Term Capital had leveraged its several billion dollars of investment capital into a market position that at times exceeded $100 billion. FINANCIAL MARKETS AND ENERGY FUNDAMENTALS **Some authoritative observers** – like former Federal Reserve Chairman Alan Greenpsan and eminent oil economic Robert Mabro -- **believe the financial markets have a sui generis impact on oil prices**. If so, there must be "fundamentals of paper markets" that one must assess along with the fundamentals of the physical markets in order to obtain a complete view of oil pricing dynamics. Others are more skeptical, believing that futures and forward prices reflect entirely information about the fundamentals of the physical market. Some of those who believe the financial markets have a sui generis impact on prices are advocating stricter regulation of energy trading activities. Given the ease of international capital movements, however, it is unclear whether regulation in and by the United States would have much effect: squeezing one part of the energy trading balloon may only cause the bubble to appear elsewhere. Discussions within the oil and finance community reflect various perspectives on the issue: do oil prices above $50/barrel and natural gas prices above $5 per MMBTU reflect classic commodity

"bubbles" in which financial markets played a distinct, sui generis role, or a "new regime" of permanently higher prices brought about by sharp increases in demand, which pushed both crude oil and natural gas into suddenly much higher marginal production costs. Recognizing that both financial and physical dynamics are always at play, the issue nevertheless is whether the financial dynamics have a distinct and measurable role. **The bubble argument suggests that developments in financial energy markets** (especially the increase in cash under management of hedge and other funds, and the decisions of index-oriented funds to take long positions in commodities, including energy) may **have precipitated a classic period of "too many buyers chasing too few sellers" of financial oil instruments**. **Such periods of "excess demand" have occurred hundreds of times in competitive markets over the course of centuries. Once oil and gas developed futures and forward market instruments, with all of the fungibility characteristics of such instruments, they too became prey to purely financial bubbles**. The **potential for such bubbles increased in recent years because of the massive scale of increased involvement of financial institutions that heretofore had not been significant players in the energy space**. For example, Robert Mabro argues that "Econometric models show that the **net position of the so-called 'non-commercial traders' is correlated with the subsequent direction of price changes**. In other words, when the non-commercial entities hold a net long position (they are betting on a price rise) prices often do rise. And the opposite impact occurs when these entities hold net short position. Is it not odd that the non-commercial players (meaning very broadly the non-oil companies) should lead and the commercial entities (broadly speaking oil or energy companies, oil users and oil-related agents) should follow in what is supposed to be an oil market?" Others believe in variations of a "new regime" argument that has two dimensions. On the supply side, they would argue that there has been a permanent movement up the oil and gas production cost curve caused by a lack of investment by and in the petroleum extraction industry. On the demand side, there has been an increase in the rate of growth in oil and gas demand (the oil side mostly from Asia; the gas side mostly from increases in the use of combined cycle gas turbines). Taken together, the new regime is characterized by increases in demand for oil and gas that exceed the increase in supply. Thus, the new regime argument indicates it was inadequate investment in production, not excess investment in financial energy markets, that was primarily behind the massive price increases of 2000 – 2006. In the oil market, many focus on the fact that spare crude oil production capacity has diminished, and there have been additional concerns over supply adequacy caused by the increasingly prominent "peak oil" thesis. Such long-term concerns can explain why market participants have bid up the price at the back of the forward curve. Sellers at the back end of the curve may believe the peak oil argument is overblown, and that in any event marginal cost does not set the crude oil price. A third and more nuanced view – in some variations related to Peak Oil – argues that the world has exhausted most of the oil that is available at finding costs of less than $10/barrel. This leads to a traditional, increasing-marginal-cost explanation for higher oil prices. The chart above presents the relationship between production cost, oil already produced, and the marginal costs of alternatives to "cheap oil" as seen by the International Energy Agency (IEA). The IEA supply curve indicates that there are 5 trillion barrels of oil available at "economic prices" of less than $70/bbl (in 2004 dollars). **If this is correct, and the oil extraction business still responds to economic opportunities, then the market prices of $70/barrel reached in 2006 were unsustainable, and constituted a classic commodity "bubble." The financial energy markets, by providing such convenient vehicles for the financial expression of views about oil scarcity, will have contributed to the bubble.** The IEA supply curve is a useful tool for pointing out that the quantity of "OPEC ME" (OPEC Middle East) available oil is curtailed by instability (as with Iraqi oil), failure to maintain fields properly (as some believe is the case with Iranian reserves), and deliberate under-production of available reserves by governments who have decided that their nations' discount rates are very, very low. The conundrum is that there is still a great deal of oil in the "OPEC ME" category, available for exploitation at less than $15/bbl, but there are political constraints on its expeditious production. Those who invest in more expensive oil are essentially taking a political gamble that this oil will continue to be held off the market, making it economical to invest in the production of more expensive conventional and unconventional oils. In essence, they are speculating on the assumption that the sub-$15 barrels are no longer on the margin. […] The fact is that financial markets offer a variety of participants, each with its own directives and trading strategies. Therefore, the effects of the oil trades of these participants would rarely flow in the same direction. An analysis of the long-term relationships between any particular group of traders and the price of oil or gas, therefore, is unlikely to provide much insight. More fundamentally, it would be naïve to expect any sustained causation between trading strategies and prices. Some trading strategies are based on the belief that markets eventually maintain fundamental relationships, and trades reflecting that belief can act as stabilizers to the market, and slow a market's adjustment to new developments. Chartists and trend traders, in contrast, can push the market quickly to new levels and can exaggerate price moves. Macro funds provide a linkage between commodity markets and other global investment markets. Fundamental commodity funds may actually enable futures prices to reflect the current expected future outcome, where current publicly available information is inadequate or inadequately distributed. There are, nevertheless, several areas where causation should not be dismissed, all of them consistent with normal economic analysis: 1. **Perfect storm episodes: there are likely to be periods of time when the condition of the physical energy market and trading strategies of financial market participants are in such good alignment as to produce "herding" and "bubbles" or their opposite, crashes.** 2. Variations on the market power syndrome: It is possible that the positions of some market participants – index funds as one example – are so large as to constitute witting or unwitting market power. A large-scale infusion or retreat from any of the various positions very large index funds might have price effects. The contract volumes involved in such shifts may -- in the scale of oil trading -- be quite large, but in the scale of money under management by these funds, be quite small. The index funds may be the "elephants in the bathtub" – especially in the long-dated markets. Analysts have traced developments in total open interest in the WTI futures contract and the price of prompt WTI.

Links

Long-Term Contracts

Long-term funding contracts distort the market- cause dominance- turns solvency

OECD '8 (OECD Competition Committee, "Energy Security and Competition Policy", http://www.oecd.org/daf/competition/abuseofdominanceandmonopolisation/39897242.pdf, January 14, 2008)

Longterm Contracts **Another means of abusing dominance is** to **for incumbents to enter into long term contracts in a way that excludes new entrants.** The idea is that, depending exactly on what is contractedóreceiving gas, selling gas to final users, access to infrastructure ónew entrants would have no access to gas, customers or to infrastructure. New entrants may bring with them efficiency-enhancing innovations, which in turn put pressure on incumbents and increases overall efficiency. The vast majority of gas bought by gas intermediaries is bought under long-term contracts. Many of these contracts were entered when the intermediaries were national monopolies [EC 2006a, p. 30] and they are often extended when the contract is still far from expiry. [EC 2007, p. 48] 10 Long term contracts can facilitate investment. Often, funding for large, sunk investments cannot be found unless long term contracts have already been signed with buyers. Examples are LNG investments and pipeline investments, where the long term contracts ensure a long term stream of revenues to pay for the investment. According to the EC, long term gas supply contracts were often linked with infrastructure investment such as a pipeline or gas-fired power station. [EC 2007, p. 39] Different market participants have different views on long term supply contracts. Gazprom says, with respect to its European market, ìThe fundamental principle of the export strategy is to maintain ìa singlechannelî export system. These objectives are planned to be achieved through developing relationships with traditional customers on a long-term contractual basis and using new forms of trade based on long-term and medium-term sales, as well as gas exchange transactions.î [Gazprom, p. 16] And, indeed, over the past several months many European gas intermediaries have entered into or extended long term gas agreements with Gazprom. The restrictions on resale and the flexibility of volumes taken in these long term supply contracts reduce liquidity in the secondary gas market. And this limits the entry of new gas resellers because they cannot provide reliable supplies to their customers. But one can argue that upstream gas producers have a choice as to whom they deal with, including with whom they enter into long term supply contracts, unless they are found to be dominant. Regarding the main reason provided for long term contracts, one question is why financial innovation, which has been so prominent in many markets, has not developed a substitute for long term supply contracts? As gas markets become more liquidórecall that only a very small fraction of LNG is sold in a true ìspot marketî and only a fraction of gas in Europe is not sold under long term contractsóperhaps financial instruments will be developed. There are also long term contracts between gas resellers and gas consumers. In some cases, these facilitate the building of, e.g., gas-fired power generators. The long term contracts provide some guarantee as to supply terms over several years, reducing some of the project risk. But in other cases there does not appear to be a related infrastructure. **Such long term contracts exclude new gas resellers. They do so because gas resellers have economies of scale and the long term contracts remove, usually large, customers from the market for several years. The result is that the scale economies are less likely to be realised and entry is more likely to be uneconomic. This exclusion of entrants extends dominance into a period when competition was envisaged.**

Bidding Process Link

The affirmatives process of selecting sectors and firms kills market competition- stifles the market which is key to solve

OECD '9 (OECD Global Forum on Competition, Roundtable On Competition Policy, Industrial Policy And National Champions, "Competition Policy, Industrial Policy and National Champions", http://www.oecd.org/daf/competition/44548025.pdf, October 19, 2009)

Where and when industrial policy co-exists with competition policy, **industrial policy should be respectful of sound competition principles.** There is not necessarily always a conflict between a properly defined industrial policy and competition policy. **There are at least three principles that help ensure that competition policy and industrial policy are more complementary than contradictory**. The first is that **industrial policy support should be as far from the market as possible.** The provision of generic capabilities can fit comfortably with competition policy and be completely non-distortionary; **the closer one gets to providing support to selected sectors and firms**, however, **the more difficult it is for industrial policy and competition policy to co-exist.** The second principle is that **support for industrial policy and competition policy should not translate into a competition policy that is perceived to be opposed a priori to large firms.** A third principle expressed is that, without compromising their own approach, competition policy enforcers can espouse prioritisation principles or apply prosecutorial discretion in a way which supports the industrial and social policy objectives of government. For example, the South African Competition Commission has articulated a strategy which prioritises the prosecution of bid rigging in large public investment tenders because public investment is the key driver of South Africa‟s economic growth and development strategy. Here there is clearly no conflict between industrial policy and competition policy. (4) **The importance both of the free market and of the protective role of the competition authorities as regards the free market should prevail**, even in times of severe economic crisis. **In fact, in turbulent times, competition itself can play a considerable role in helping to steady "economic nerves"; competition law and policy, as instruments that protect competition, are therefore of significant value. It is axiomatic that political concerns are capable of influencing proposed solutions to a given economic crisi**s. Consequently, **such solutions may be formulated in a manner that does not respect the pro-competitive principles of the free market**. At all times though, **policy makers should recognise the fact that robust competition policy is essential in order to prevent long-run harm to the global economy in the period following the stabilisation of economic conditions.** In dealing with the current crisis **one must ensure that competition law and policy continue to apply to, and to be respected in, all sectors of the economy, including the financial sector**. While it is true that state interventions may be both necessary and appropriate, **any policy instrument used should be neutral and be applied across the board.** Importantly, a well-designed competition policy will display sufficient flexibility to allow for the achievement of other policy objectives. It should also be remembered in this context that competition policy is capable of addressing many of the concerns that are usually offered in support of industrial policy: · First, **strong competition ensures that inefficient firms leave the market and that production is rationalised without requiring government-sponsored mergers**. **In contrast**, in times of distress **the creation of national champions with market power is often at odds with merger control policy**; alternatively, **governments sometimes attempt to bend the merger control process to further industrial policy goals or to prevent** the **takeover** of a national champion **by a foreign firm. Recent cases have displayed this tension between industrial and competition policy, as several governments**, especially in Europe, **have expressed concerns over cross-border mergers in politically sensitive sectors such as banking and energy, and attempted to create or protect their national champions.** It can be argued that their economies would have been better served over the long term by a competition policy approach, rather than one favouring industrial policy goals. In particular, research and practical experience has shown that the main assumptions which DAF/COMP/GF(2009)9 13 underpin the rationale for creating national champions - through merger or other methods - are actually weak, or evidence supporting them is mixed at best (see also para 17 below). · Second, **competition can restrain exploitative pricing by foreign firms that possess market power and can**

facilitate entry into sectors dominated by a few foreign firms. The struggle against exploitative pricing, particularly in a crisis, involves an obvious choice that governments have to make between competition policy and industrial policy. Competition policy is probably a superior answer because it is far less costly. Research has shown for example that the annual total cost of implementing American antitrust policy was less than the annual deadweight loss induced by just the vitamins cartel, and that only in the United States. Also, implementing competition policy does not give rise to all the difficulties and risks associated with promoting national champions, including productive inefficiency (due to the wasteful duplication of fixed costs for example). · Finally, **intense competition ensures that companies are more efficient**; **it provides managerial incentives to reduce waste and increases incentives to innovate.** An important point for policy purposes is that competition policy generates benefits domestically and internationally. When a competition authority prohibits a merger or an exclusionary practice and thus protects competition, this benefits all customers in the affected market, including abroad. In the case of cartels, there is less cross-country complementarity because firms may decide to collude only in countries with a weak competition policy. However, even in the case of cartels, there are some cross-country positive externalities because companies can more easily cartelise an industry when they interact in many countries, since multi-market contact facilitates collusion. These considerations imply that the case for competition policy is even stronger than would appear on the basis of a country-by-country analysis.

Subsidies Link

Subsidies cause market distortion and trade-off with private capital

Loris '11 (Nicolas Loris is a policy analyst in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation, "No More Energy Subsidies: Prevent the New, Repeal the Old", http://www.heritage.org/research/reports/2011/07/no-more-energy-subsidies-prevent-the-new-repeal-the-old, July 26, 2011)

Abstract: Are Americans energy dependent? Yes—dependent on government energy subsidies. In 2007, American taxpayers subsidized government-preferred energy sources to the tune of nearly $17 billion. Increasingly, it is politicians in Washington who decide how Americans produce and consume energy. But **subsidies for special interests stifle competition, raise energy prices, and decrease economic opportunities**. It is time for Washington to eliminate all government subsidies and special policy treatments that benefit certain industries at the expense of others. **Energy companies should rely on innovation and efficiency, not** American **taxpayers**, to thrive in a system of free enterprise. Americans are becoming too energy dependent. But it is not dependence on foreign sources of energy that is the problem; it is growing dependence on the federal government. According to the Energy Information Administration, the United States spent $8.2 billion on energy subsidies in 1999. That spending more than doubled to $16.6 billion in 2007, and with the stimulus funding and other provisions, it promises to have a much higher price tag in the years ahead. With direct expenditures, targeted tax breaks, mandates, loan guarantees, and other preferential treatment, Washington is deciding how Americans produce and consume energy. Increasing America's access to energy resources creates competition, lowers prices, drives innovation, and creates economic opportunity. Subsidies do the opposite. Congress should make it a priority to ensure that no new subsidies are put in place and remove the ones already in place. What Are Subsidies and Why Are They Harmful? In public policy, subsidies come in many shapes and sizes and are thus often difficult to define comprehensively. The definition "direct transfer of money to a group or industry" is too narrow, so for the purpose of this paper, a better definition is "Using the political process to support the production or consumption of one good over another." **Providing subsidies is bad economic policy for a number of reasons. Government support that targets one group or industry artificially props up that market. Rather than increase competition, a** special **endorsement** from the government **gives one technology an unfair price advantage over other ones**. Further, **subsidies reduce the incentive for that technology to become cost-competitive and encourage dependence on the preferential treatment that government gives them**. Those energy sources that need help from the government are those that cannot compete economically without them. **If a project makes economic sense**, however, **the investments will occur without the subsidy**. In that case, **the subsidies simply offset the private-sector investments that would have been made either way**. **Another destructive feature of subsidies is** that **they allow Washington to direct the flow of private-sector investments**. **Targeted direct expenditures, tax breaks, loan guarantees, and other** government **subsidies allocate resources away from more competitive projects**. **If the government gives a tax credit** to banana producers only, **it shifts** more labor and **capital towards banana** production **and away from other economic activities**, like strawberry or grape production. **The market**, not politicians in Washington**, is a good determinant of how to allocate resources and meet consumer demand.** Furthermore, **when** the **government dictates how private-sector resources are spent**, **those industries that benefit greatly from such policy decisions will spend more money lobbying for government handouts.** The banana producers will push for tax-credit extensions. The apple producers will complain that they are at a disadvantage and lobby for their own handouts. **This process results in the continuous picking of winners and losers.** It is not the role of the government to determine what type of energy consumers use and using the political process to pick winners and losers distorts the marketplace and increases the incentive to energy companies to lobby for handouts. Conversely, reducing government control of the energy economy reduces the incentive to use the political process for gain. Congress should make it a priority to prevent any new subsidization of energy sources and technologies and peel back the ones in place. Forcing sunsets of preferential tax credits and offsetting the tax increases with lower rates across the board would simplify and improve the tax code. Prevent and Remove Direct Spending There has been a growth in direct energy expenditures in the United States, largely because of the more than $40 billion awarded to the Department of Energy (DOE) from the American Recovery and Reinvestment Act (ARRA), known as the stimulus bill. Of that amount, $16.8 billion went to the Office of Energy Efficiency and Renewable Energy (EERE). But even through its yearly budget process, the Department of Energy spends billions of dollars to fund applied-research programs. Another program the Energy Information Administration (EIA) lists as a direct expenditure is the Low Income Home Energy Assistance Program (LIHEAP). To prevent more direct government market distortions in the energy sector and prevent wasting taxpayer dollars, Congress should: Prohibit any new funding. Congress should ensure that no taxpayer dollars go directly to energy production, storage, efficiency, infrastructure, or transportation for non-government consumers. While this type of spending may be important, it is better financed through the private sector, which is better positioned to make efficient investments that meet consumers' needs. Eliminate government attempts to commercialize technologies. The DOE has spent billions of research dollars on technologies to reduce carbon dioxide emissions, including energy efficiency technologies, renewable energy sources, carbon capture and sequestration, clean coal technologies, nuclear energy, and alternative-energy vehicles. All these energy sources and technologies are available today, but they are not commercially viable, whether due to burdensome regulations or simply because they are still prohibitively expensive. It is not the government's role to force these technologies into the marketplace and Congress should remove all funding for DOE-funded commercial activities and focus on removing the onerous

regulatory barriers that prevent energy technologies from reaching the market.[1] Congress should focus on a more efficient system in which the private sector can use government resources such as national laboratories funded by the private sector. Eliminate LIHEAP. LIHEAP is meant to help low-income households pay fuel bills, but it has rapidly expanded, is duplicative, and has been riddled with fraud and abuse. A 2010 Government Accountability Office (GAO) study found that the Department of Health and Human Services distributed funds to thousands of deceased and incarcerated people and claims that LIHEAP-application processors awarded funds to GAO officials using fake addresses and fake energy bills.[2] Eliminating LIHEAP certainly does not mean there will be no money for low-income households to pay for energy costs. The federal government runs more than 70 means-tested aid programs that provide cash for food, housing, medical care, and social services. Total federal and state spending on means-tested assistance to low-income persons will exceed $900 billion this year.[3] Furthermore, cash, food, housing, and energy aid are highly fungible when they reach the household level, so households are in the best position to determine which good they need most. While President Barack Obama proposed to significantly cut LIHEAP in his FY 2012 budget request, Congress should eliminate LIHEAP funding entirely.

Demonstration Link

Demonstration projects cause picking winners- government empirically fails at commercializing projects

- ***Specific nuclear power and clean coal**

Deutch '7 (John Deutch, Institute Professor, MIT Department of Chemistry, Member of the MIT faculty since 1970, and has served as Chairman of the Department of Chemistry, Dean of Science and Provost. Professor Deutch earned a BA in history and economics from Amherst College, and both the BS in chemical engineering and PhD in physical chemistry from MIT. He has also held significant government posts throughout his career. In May 1995, he was sworn in as Director of Central Intelligence following a unanimous vote in the Senate, and served as DCI until December 1996. In this position, he was head of the Intelligence Community (all foreign intelligence agencies of the United States) and directed the Central Intelligence Agency. From March 1994 to May 1995, he served as the Deputy Secretary of Defense. From March 1993 to March 1994, Dr Deutch served as Under Secretary of Defense for Acquisitions and Technology. In addition, he has served on many commissions during several presidential administrations, "What should the government do to encourage technical change in the energy sector?", http://globalchange.mit.edu/files/document/MITJPSPGC_Reprint07-22.pdf, February 2007)

Virtually every energy study recommends that the federal government mount technology research, development, and demonstration (R,D,&D) programs that require large and sustained budgetary support, of course, funded by the taxpayer. Contemporary examples include: (1) the call for a major effort on carbon capture and sequestration; (2) subsidies for renewable technologies, such as photovoltaics and wind; (3) development and demonstration of fuel cells and new techniques for hydrogen production, transmission, and storage; (4) clean coal technologies, such as the Integrated Coal Gasifi cation Combined Cycle; and (5) biofuels, a vague term that encompasses a range of processes from corn-based gasohol production to use of modern biotechnology to develop new organisms that can effi ciently convert cellulose-based feedstock to ethanol or other liquid products. Every advocate for each of these technologies is genuinely convinced of the merit of each approach for achieving desirable technical change and the justifi cation for government subsidy. However, candour is often lacking about the motivation to capture benefi t for a particular interest group or constituency, whether farmers, university researchers, or private fi rms. Reducing carbon emissions will undoubtedly require introduction of new energy technology on a vast scale – coal gasifi cation, carbon capture and sequestration, alternative fuels for transportation, greater use of biomass feedstock, better energy effi ciency in production, transportation and end-use, carbon-free electricity generation from solar, wind, geothermal, and nuclear. We need to understand what are likely to be effective and what are likely to be ineffective government policies to encourage the adoption of new energy technologies. The government must decide which of the many candidate R,D,&D programs to pursue, how large a program to mount, and how best to manage the effort. My purpose in this paper is to answer two questions: (1) What have we learned from past government efforts at encouraging large scale energy R,D,&D technology programs? and (2) What tools do we have for doing so in the future? I draw from my experience as an offi cial in the Department of Energy from 1977 to 1980 and in the Department of Defense from 1993 to 1995, as well as my work with several private energy fi rms and national laboratories. **Innovation is the process by which technical change is accomplished. The innovation process consists of two steps: The first step is technology creation** – the discovery of new science or technology. The government, private industry, and foundations sponsor discovery activities. Industry, universities, and both federal and not-for-profi t laboratories and hospitals perform this R&D. **The second step is the deployment of the new science and technology** into an enterprise or the society. **This is, by far, the more difficult step in achieving technical change**, **because it usually involves**: (1) **making an uncertain investment decision**, (2**) managing change in a production process**, along with its work force, **and (3) tailoring a new service or product to customer need.** Nations and fi rms that do innovation well have an advantage over their competition and enjoy greater economic growth. Innovation has as its objective both improved performance at fi xed cost and fi xed performance at lower cost. For example, in the case of accommodating to new environmental regulations, the objective of innovation is to maintain output while meeting more stringent standards, and at roughly the same cost as before the regulation. The government role The government has three functions in the innovation process. The fi rst function is to set the rules for the innovation activity. Setting the rules enables innovation and determines whether the innovation process will perform well or not. Examples of important rules include: • establishing patent, publication, and intellectual property rights; • setting and publishing standards – such as for materials, products, safety; • tax treatment for R&D activities; • setting export controls on technology transfer and participation of foreign scientists and engineers in the US R&D enterprise; • educating scientists and engineers who will enter the technical work force; • creating mechanisms for industry/university/ government partnerships; and • providing access to venture capital. The importance of the rule

setting function is frequently overlooked. However, countries that set the innovation rules 'right' do a lot better than those who do not. **The second government function is supporting technology creation**. The justifi cation for this role is well founded, especially for the early stage of the discovery process. Uncertainty as to the eventual realization of long-term benefi ts from fundamental research means that private fi rms are not assured of capturing these benefi ts and so will invest less than what is optimal for the society. Accordingly, the government has a role in supporting early stage 'pre-competitive' technology where the results are made available to all (since precise benefi ts are diffi cult to predict). It is in the technology creation phase that the US government has proven most successful in encouraging innovation. The federal government plans to spend above $132 billion in 2006 for all R&D activities 1 with $71 billion for DOD, $8,5 billion for DOE, and $0,6 billion for EPA. The total for technology base activities – basic and applied research – is $55 billion. The most important agencies in this effort in the past have been the National Science Foundation, the National Institutes of Health, the Department of Defense, and the Department of Energy. Federal support to basic and applied research and for the creation of research facilities has a long history in this country. No other nation has remotely as successful an enterprise, and our practices are the model for the rest of the world. The hallmark of the US approach is project selection according to merit, and, in general, fl exibility in accommodating education as an important by-product of funded research activity. The successful government manager in an agency that fosters technology creation is knowledgeable about advances in the fi eld and attentive to outside expert opinion; direct support of R&D projects is the manager's major tool. The government's ability to infl uence technology adoption **The third function of government is to engage in the second stage of the innovation process**. **Here the government has a good deal more difficulty in accomplishing or influencing the process of transfer, adoption, and deployment of new technology. The closer the government-**sponsored **activity comes to demonstrating a** potentially useful commercial **product, the more difficult it is to justify spending taxpayer money,** rather than relying on private market decisions. Moreover, how should benefi ts be shared when the government supports a private fi rm in demonstrating the practical application of a technical advance? The government faces the technology transfer problem in two situations: In the fi rst situation, the government is the sole customer of the technology that it has created. The traditional examples are the nation's defense, intelligence, and space programs. For this category, the problem of technology transfer is simpler, because the government runs the activity. The desired technical change does not have to meet a market test but rather needs to meet performance goals established by the government. Examples are: NASA's Mars landing program or the DOD's effort to transform military technology. In this situation, the major uncertainty facing the government manager is whether a technology project will meet set performance, schedule, and cost objectives. Of course, the cultural hurdle of convincing existing institutions to accept change is present, but the uncertainties associated with a large private market are not. History shows that the United States has been quite successful in utilizing technology for government activities and achieving the second step of the innovative process, for example, in exploiting technology for the military. To be sure, the process may be spectacularly expensive, but the job gets done by relying on an internal resource allocation process that applies some discipline to the entire activity. It is important to appreciate that, in practice, much government-funded technology creation to support public activities has an enormous range of unplanned benefi ts to the commercial economy. For example, DOD-supported technical advances on network communications, computer systems, and solid state electronic devices, motivated by military applications, are largely responsible for today's modern information technology society. The United States enjoys a great advantage from the fl exibility that this 'dual-use' pattern provides – an advantage that other nations, for example, the Soviet Union, were unable to exploit. In the second situation, the government hopes to have the private sector adopt technology created through federally sponsored R&D. However, **the private sector will adopt new technology only when it believes the innovation will be profitable under anticipated market conditions.** Thus, if the government hopes to encourage adoption of new technology the government program must take into account the uncertainties associated with a private market – for example, market prices – that send different signals for both the supply and demand of the products and services must be considered in addition to the uncertainties of the R&D process. There is the additional question that if the federal government pays for R&D that allows a private fi rm to achieve a valuable innovation, should the private fi rm be required to share the benefi ts with the government? **The government has a mixed record of achieving desired technical change in the private sector.** The National Institute of Health has been remarkably successfully in fostering advances in the biomedical sciences and transferring this knowledge and associated technology to both big pharma companies and small biotechnology companies born from NIH-funded research at universities, medical schools, and hospitals. Over the years, the Department of Agriculture's extension service has successfully transferred technology and know-how to the American farmer, enabling a vast increase in agricultural productivity. **The record of the Department of Energy and its predecessor agencies is decidedly more mixed**. Government efforts to cause technical change in the energy sector – 'commercialization' of energy technology In the United States, **energy is part of the private sector**. While there is broad agreement about the reasons for government concern with energy policy, 2 **there has been much less agreement about the federal role in the later stages of commercialization** of energy technologies, **because such efforts require the** federal **government to make a judgment about future winners and losers in the private marketplace. There is considerable skepticism that the DOE can effectively make such judgments, because the government bureaucracy lacks the necessary skills, and the agency is subject to short-run Congressional interests.** Nevertheless, the DOE has always included technology commercialization as an important part of its mission, especially in the

areas of energy effi ciency, renewable energy, clean coal, and advanced nuclear power. **DOE has tried a variety of mechanisms over the years to achieve this commercialization**: 1. **The DOE** and its predecessor agency, the Energy Research and Development Administration (ERDA), **have sponsored technology development in the Department's national laboratories**. **Although various efforts have been made to encourage transfer of these technologies** to the private sector, **it has generally proven difficult to accomplish**. An important reason is that the **national laboratories are focused on technical performance rather than cost.** 2. **Nuclear power has received special attention** from DOE, ERDA, and its predecessor agency, the Atomic Energy Commission (AEC), because the technology originated exclusively from the government weapons program. **While there were some notable technical successes**, **most knowledgeable observers would consider that the effort failed especially with regard to nuclear waste disposal and high capital cost**. 3. Beginning in the 1980s, **the DOE launched a program focused on clean coal technology** that operated by competitive selection of strictly costshared industry projects. **While there were some successes, the results of this effort were mixed**. 4. **Another approach relied on government-funded demonstration plants** (sometimes conducted with industry partners): examples include the Clinch **River Breeder Reactor, the Barstow Solar Power Tower**, and several synthetic fuel plants. **The record here is particularly poor. The projects frequently were over-budget and conveyed little useful information to the private sector.** 5. **On several occasions, the DOE has undertaken smaller scale demonstrations**, eg, photovoltaic, wind, and fuel cell projects. **However, these efforts are more a response to Congressional interest than a serious attempt at technology transfer.** 6. The DOE has from time to time experimented with supporting industry consortia on the reasonable ground that industry-managed efforts have a greater chance to cause technical change in the private sector. Examples include support for the Gas Research Institute (GRI, now abandoned), the Advanced Battery Consortium (ABC), the Partnership for a New Generation of Vehicles (PNGV), and encouraging (but not directly funding) the Electric Power Research Institute (EPRI). Each of these efforts has made some contribution, but none has been suffi ciently successful to suggest adopting consortia as a general model. 7. From time-to-time, federal purchase programs, for example, for natural gas or electric vehicles, are suggested as an effective way to demonstrate new technology. More problematic are proposals for buy-down campaigns (for example, for photovoltaic modules), as an effective way to drive unit costs of new technology down to economic levels. 8. Federal and state subsidies, usually in the form of tax credits for favoured technologies, such as wind and bio-fuels, are offered as an effective way to promote energy technology. The rationale for this approach is using public money to provide information to the private sector about the economic, technical, and environmental performance of new energy technology, and that successful demonstration projects should infl uence actions by the entire industry. On one occasion, the government mounted a much larger scale attempt to introduce technology that would change the course of energy development in this country. The signifi cance of this case is that it was the only effort that approaches the scale of government action that many believe is necessary today. Lessons from the Synthetic Fuels program I ask you to recall the infamous Synthetic Fuels Program, launched in 1980 and ignominiously abandoned in 1986. The lessons of this experience go beyond the criticism of censorious economists of government involvement in technology commercialization. The Energy Security Act of 1980 established the US Synthetic Fuels Corporation (SFC) 3 at the height of the oil crisis for the purpose of establishing a domestic industry to produce synthetic gas and liquids from tar sands, shale, and coal, as an alternative to oil imports. At the time of the SFC debate, oil prices were about $40/barrel and seemed to be headed for $80-100/b. With little relevant experience, engineering estimates were that synfuels would cost about $60/b. Accordingly, there was signifi cant political pressure to demonstrate domestic synfuels production capability that would act as a 'backstop' to the seemingly endless upward movement of imported oil prices. Congress, industry, and a surprising number of informed energy and international security experts argued that the proper way to demonstrate this 'backstop' price was to establish a production target: 500 000 b/d for phase one. The initial 'fi rst of a kind' plants were expected to cost more, justifying a larger subsidy to begin the 'learning' process that many believed would result in lower costs. As late as 1982, in the Reagan administration, the DOE estimated that synfuels production in 2000 could be between 474 000 and 3,2 million b/d oil equivalent. 4 The subsequent sad story is well known. In fact, the price of oil did not go to $100/b but rather tumbled to less than $20/b. The SFC struggled on, managing a handful of projects, until it was terminated in 1986. 5 Most of the projects selected by the SFC were brought in on schedule but at a cost vastly above the prevailing market price. The most charitable, but wrong characterization of the principal lesson of the SFC is that the mistake was to misestimate future oil prices. There are many aspects of the SFC that can be criticized, but to condemn the basic rationale because the price of oil fell, is like faulting someone for buying an insurance policy, paying the premium, and then living. It is not a mistake per se to buy insurance or a hedge that later proves to be unneeded.

And demonstration programs lack stable funding due to administration turnover- jacks credibility- turns case / politics link turns case

Deutch '7 (John Deutch, Institute Professor, MIT Department of Chemistry, Member of the MIT faculty since 1970, and has served as Chairman of the Department of Chemistry, Dean of Science and Provost.

Professor Deutch earned a BA in history and economics from Amherst College, and both the BS in chemical engineering and PhD in physical chemistry from MIT. He has also held significant government posts throughout his career. In May 1995, he was sworn in as Director of Central Intelligence following a unanimous vote in the Senate, and served as DCI until December 1996. In this position, he was head of the Intelligence Community (all foreign intelligence agencies of the United States) and directed the Central Intelligence Agency. From March 1994 to May 1995, he served as the Deputy Secretary of Defense. From March 1993 to March 1994, Dr Deutch served as Under Secretary of Defense for Acquisitions and Technology. In addition, he has served on many commissions during several presidential administrations, "What should the government do to encourage technical change in the energy sector?", http://globalchange.mit.edu/files/document/MITJPSPGC_Reprint07-22.pdf, February 2007)

The primary lesson of the SFC story is that the government should be very cautious in establishing large programs based on the assumption that current estimates will come to pass. **The potentially expensive word 'demonstration' should be carefully defined to avoid adopting** either production **targets or fanciful buy-down or learning ideas independent of real market experience** and unexpected political, regulatory, and technical events. The SFC experience would have been more successful or, at least, less expensive, if 'demonstration' had meant providing information to the private sector on the technical, environmental, and cost of a synfuels technology, rather than attempting to achieve production targets independent of the prevailing market price for conventional oil and gas. The SFC experience warns against formulaic approaches, such as 'renewable portfolio standards' and arbitrary emission reduction targets, as a safe or effi cient way to encourage new technology. However, the SFC offers other lessons that are relevant today: First, indirect incentives – production payments or tax credits, loans or loan guarantees, guaranteed purchase – are more effective for 'demonstrating' to the private sector that a particular technology can be economic and profi tably deployed. The alternative of direct DOE involvement in the design and the payment for the cost of a demonstration plant 6 is simply not credible to the private sector. Second, the strength of federal support for R&D lies in the earlier stages of innovation, especially in creating the basis for new technology. Government procurement rules are not germane, and the expertise of government R&D managers is not relevant to the decision-making required for investment under uncertainty that is at the heart of the commercialization phase of a new technology. Third, large energy outlay programs attract more than normal Congressional interest. Understandably, members like to have the projects in their districts and seek to infl uence the DOE decision-making process. A quasi-public corporation, such as the SFC, insulates the program to some considerable degree from Congressional pressures and the annual budget cycle. The way forward Given these observations, what can I say about the way forward? My general proposition is this: If we want to bring about signifi cant reduction in carbon emissions over the next half-century and stabilize greenhouse gas concentration thereafter, without greatly sacrifi cing economic growth, we must achieve tremendous technical change in the energy sector. Accomplishing this technical change in an effi cient and timely way requires considerable government involvement. At present, the adequate resources have not been made available, and the capacity of the US government to demonstrate usefully new technology is uncertain. If the government signals to the private sector that there is a signifi cant cost for greenhouse gas emissions, such as CO_2 , there will undoubtedly be a market response of adopting new technology, deploying more energy effi cient capital, fuel switching, and shifting to less energy intensive products and services. But progress, and especially technology adoption, will be slower absent an effective government program for technology creation and demonstration. Availability of energy technology development and demonstration resources The FY2006 DOE R,D,&D budget is about $2,2 billion for all energy supply and conservation technologies – renewables, fossil, nuclear, energy effi ciency. 7 This amount is signifi cantly less than the FY80 budget provided for comparable activities, not including the SFC. In my opinion, the budget authority should be two or three times the proposed amount, at least $5 billion per year for the next decade. The level might well rise if the United States decided to participate in a major way in international R,D,&D. **Justification of an increase of this magnitude would require** not only a shift in administration policy as to the importance of avoiding global climate change, but also **a considerable improvement in DOE's ability to manage a balanced technical program** (balance with regard to both technology choice and between R&D and demonstration). **Unfortunately, it is virtually certain, given today's fiscal concern** with the twin trade **and budget deficits, that increases in discretionary programs** – especially those that lack administration support – **are unlikely to be appropriated by Congress.** On the other hand, greater spending on R,D,&D should be an effective argument against more expensive alternatives, for example, government buy-down programs. DOE's capacity to manage technology commercialization efforts **We should be realistic about the capacity of the DOE system to manage technical innovation**. The Department's strength in technology management is with R&D – the discovery phase of the innovation process. Technical program managers can rely on the considerable expertise that resides in the Department's laboratory system. Appropriated funds directly support the cost of the R&D, so there is reasonable control over the work effort, whether performed by government laboratories, universities, or industry. On the other hand, **how well can DOE meet the criterion for a technology commercialization success? For a first-of-a-kind demonstration**, the criterion is whether information obtained about

technical performance and cost infl uences private sector investment decisions. As I have mentioned, **the DOE has no expertise at making investment decisions under uncertainty that is the key to private sector innovation**. **It is unreasonable to believe that the DOE, or indeed, any government agency, can develop this expertise in-house or** (as has been attempted from time to time) contract for it. But, **there are other hurdles as well**. **The federal and DOE procurement rules and management practices make it difficult to structure a demonstration project that is credible to the private sector**. **The DOE** is accustomed to financing projects by paying directly all or a portion of project cost, and it **does not have experience or authority in the use of indirect incentives**, **such as guaranteed purchase** or favorable financing **that might place a demonstration project,** for example, a photovoltaic production plant, **on a commercial footing**. Most importantly, **the success of any commercialization project requires a stable source of funding** on a set project schedule. **Frequent changes in direction mandated by a new administration or a Congressional committee is not good**. Finally**, DOE and its oversight committees in Congress are continually lobbied by special interests** – coal, carbon, California – **who argue for projects that benefit their industry, community, or public interest constituency. Under these circumstances**, **it is almost impossible to adopt and sustain an objective and analytically based energy technology commercialization strategy.** Adopting new energy commercialization mechanisms I conclude a successful government program of demonstration of new energy technologies requires the establishment of a new mechanism, signifi cantly different from the current DOE program approach. To be successful the new mechanism must be able to: 1. provide indirect incentives in order to make the demonstration as credible as possible to private investors; 2. rely on commercial practices free from the government procurement rules that govern funding of R&D projects; 3. have access to adequate, multi-year funding that permits effi cient execution of the demonstration projects. How might such a new mechanism for selection and management of projects that receive government assistance be organized? It is conceivable that a separate unit within DOE might be established with these authorities, but I doubt it. Some years ago, Professor Paul Romer offered an interesting suggestion of relying on self-organized industry investment boards that would operate somewhat as a bank to fi nance projects of collective interest. 8 I prefer an approach that creates a separate quasipublic corporation – the Energy Technology Corporation (ETC) 9 – that is based on the best features of the SFC. The ETC would select and manage technology demonstration projects without favouring particular fuels or supply over end use. Just as in the case of the SFC, the ETC would be composed of independent individuals with experience and knowledge about future market needs, industry capability, and best use of indirect fi nancial incentives – loans, loan guarantees, production tax credits, and guaranteed purchase – in order to run a project on as commercial a basis as possible. The ETC would not be subject to federal procurement rules, and if fi nanced with a single appropriation, would be somewhat insulated from congressional and special interest pressure. The key difference between the SFC and ETC is that the ETC would buy information and not produce pre-determined output quantities. The information would guide the future investment decisions of private sector entities (and the banks that fi nance their activities); therefore the charter of the ETC would need to be carefully drawn. It does not make much sense to establish such a mechanism unless the scale of the effort is substantial; such as capital in the range of $10 billion. This amount would permit the ETC to provide suffi cient fi nancial incentives (but not to pay the entire cost) for a range of technology demonstration projects, for example: (1) capture ready IGCC, (2) photovoltaic module fabrication, (3) new nuclear plants, (4) electric grid modernization, (5) time of day metering, (6) stationary fuel cell plants, (7) hybrid vehicle production. The ETC would not sponsor R&D or fund process development units – these activities would remain the responsibility of the DOE. Thus the ETC would not support carbon capture and sequestration science but would support a demonstration project. Conclusion The social cost of reducing carbon emissions in the long term requires major technical change. **Currently, we** – the United States and the world – **do not have the necessary mechanisms in place and are not devoting the level of resources necessary to encourage the needed private sector adoption of new technology. Successful government action requires both more resources and a willingness to change the conventional approach to** government's **support for energy technology commercialization.**

Nuclear Energy Link

Nuclear energy subsidies cause market distortion- private sector autonomously solves- subsidies cause a net-worse industry in the long-run

Spencer and Loris '8 (Jack Spencer is Research Fellow in Nuclear Energy and Nicolas D. Loris is a Research Assistant in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation, "Washington Subsidies not Necessary to Rebuild U.S. Nuclear Industry", http://nukefree.org/news/federalsubsidiesnotnecessarytorebuildnuclearindustry, November 10, 2008)

Concerns over global warming, energy dependence, and rising fuel prices are leading many to seek out alternatives to fossil fuels. Nuclear power is one available alternative that could help reduce dependence on foreign energy sources that is both emissions-free and affordable. Aside from the regulatory hurdles, one difficulty with employing nuclear technology is that the U.S. no longer has the industrial infrastructure to support a broad expansion of nuclear power. Some Members of **Congress** have **suggested** that **federal government handouts, using the euphemism "incentives," are necessary to get the nuclear industry up and running again**. **This is simply not the case**. The nuclear industry has already begun its expansion. **Instead, Congress should concentrate on** guaranteeing regulatory stability, opening foreign commercial nuclear markets, and **developing a** sustainable, **free-market approach** to nuclear waste management. Nuclear Expansion Can Reduce Costs of CO2 Reductions The Lieberman-Warner climate-change bill (S. 3036, originally introduced as S. 2191 in 2007) introduced in Congress earlier this year would have mandated drastic reductions in America's CO2 emissions. A recent Heritage Foundation analysis estimated that the bill would have cost the U.S. economy between $1.8 trillion and $4.8 trillion by 2030, along with lost manufacturing jobs exceeding 2 million in certain years.[1] Although the bill died a quick and justified death, a new version of the bill will most certainly be introduced in the coming year. While the Heritage analysis shows the economic impact of the Lieberman-Warner bill under a likely mix of energy sources based on today's policies, other analyses study how alternative energy mixes can mitigate the costs of CO2 reductions. While these analyses differ, they all point to the same result: Nuclear power is critical to reducing CO2 emissions affordably. Not only does the U.S. need nuclear power, but an enormous amount of nuclear power is needed quickly. An Environmental Protection Agency (EPA) analysis assumes a 150 percent increase in nuclear power by 2050 to meet Lieberman-Warner CO2 reduction targets.[2] While meeting this demand would require a substantial industrial effort, it is minuscule in comparison to an Energy Information Agency (EIA) analysis that suggests that the U.S. must increase its nuclear capacity by 268 gigawatts of new nuclear power by 2030 in order to meet the same objectives.[3] Today, the U.S. has 104 operating nuclear reactors with atotal capacity of approximately 100 gigawatts. New reactors would likely be larger on average than existing reactors. Assuming that the average new reactor would produce about 1.3 gigawatts of electric power, the EPA analysis would require nearly 50 new reactors, while the EIA's analysis would require about 200 over the next 25 years. The problem is that the United States has not ordered the construction of a new reactor since the mid-1970s, and today does not have the industrial infrastructure to build even a single reactor with all-domestic components. The U.S. industrial and intellectual base atrophied as the nuclear industry declined over the past three decades. Large forging production, heavy manufacturing, specialized piping, mining, fuel services, and skilled labor all must be reconstituted. Simply expanding domestic capabilities will not be enough, however, to support a broad nuclear expansion. The U.S. will also need to maximize its access to foreign capabilities and human resources to achieve CO2 reductions with nuclear energy. **Washington Help Is Not Necessary** Having recognized the discrepancy between the capacity required to support a broad nuclear expansion and what exists today, many in Congress have sought to take action to grow America's nuclear industrial base. Unfortunately, many of their proposals are little more than industry handouts. They largely consist of taxpayer-subsidized workforce programs and manufacturing-expansion tax breaks. But **these programs are not necessary**. **The potential market for new nuclear reactors** and **the services necessary to keep them running is so large that the private sector is already beginning to expand.** Those that invest wisely today will be the ones best positioned to take advantage of the emerging nuclear markets in the future**. Federal government intervention only distorts the risk of these companies**, **causing them to either make investments that they would not have otherwise**, **or** d**iscounting the costs for investments that they would have made anyway**. **Either case leads to an inefficient marketplace that would ultimately lead to a weaker overall industry**.

Lack of subsidies generates the best long-term nuclear industry- autonomous private action solves- regulations are a massive alt cause

Spencer and Loris '8 (Jack Spencer is Research Fellow in Nuclear Energy and Nicolas D. Loris is a Research Assistant in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage

Foundation, “Washington Subsidies not Necessary to Rebuild U.S. Nuclear Industry”, http://nukefree.org/news/federalsubsidiesnotnecessarytorebuildnuclearindustry, November 10, 2008)

While acting without federal government funding may sound risky to some, **the companies that make good investments today will be better positioned as nuclear energy leaders tomorrow.** The bottom line is that **companies do not need the federal government to tell them where to invest**. Indeed, the **private sector is already organizing itself to identify investment opportunities**. The Edison Welding Institute recently put together a consortium of nuclear companies to identify supply-chain weaknesses, to prioritize objectives, and to improve quality.[24] Similarly, the Nuclear Energy Institute has implemented a comprehensive nuclear-suppliers program that is achieving similar goals. These associations are how industry will determine-without interference from Washington-where capabilities must be strengthened. A Nuclear Awakening **Large universities and local community colleges are expanding to meet industry's demands for more engineers and skilled laborers**. According to the Nuclear Engineering Enrollments and Degrees Survey of 2006, the most recent study available, "The number of B.S. degrees granted in 2006 by nuclear engineering programs increased by almost 30% over 2005, reflecting the substantial increases in enrollments reported in recent years. The number of B.S. degrees in 2006 is the highest reported in the last ten years."[25] It is no wonder that major universities are ramping up their nuclear engineering programs. The nuclear industry's high demand for engineers begets higher salary offers, which in turn, result in greater enrollment in nuclear engineering. Purdue University, a school historically known for its nuclear engineering program, has almost tripled its enrollment in this program since the year 2000 to 135 students.[26] Texas A&M has one of the fastest-growing nuclear engineering departments in the country, the University of Florida has continued increased enrollment as well as an increase in its research grant awards, and a total of 31 schools continue to offer a degree in nuclear engineering.[27] Other schools, such as the University of Virginia, are re-establishing their nuclear engineering programs and expect to generate a great deal of interest.[28] The upward trend in the number of nuclear engineering students is also generating a high demand for quality professors. In addition to large university nuclear program expansions, community colleges are beginning to collaborate with private companies to offer education and training in skilled and craft labor. Duke Energy recently donated $1.25 million to North Carolina State University's College of Engineering, which will create a professorship in engineering and advocate the teaching of engineering in grade schools and high schools.[29] Progress Energy, a utility, recently awarded a $60,000 grant to Florence-Darlington Technical College's Advanced Welding and Cutting Center to meet the increased demand for pipe welders, who have critical skills for nuclear plant construction.[30] The New Jersey-based Public Service Enterprise Group(PSEG) piloted an entry-level technical-trade program at Mercer County Community College that provides training and education for specific technical jobs. Additionally, PSEG is reaching out to high school students to discuss opportunities in the nuclear and electric power industry.[31] While these investments may seem inadequate relative to the enormous industrial expansion required for a broad nuclear renaissance, it is important to put them into context. Despite all of the talk in recent years about expanding nuclear power, no construction on new plants has begun to date. So at least until now, investment appears to be staying ahead of market demand. In other words, lack of resources is not the culprit for the lack of new nuclear plants. If nuclear power expands significantly, however, there may indeed be some lag time before delivery of certain capabilities and components. That should be expected as the industry rebuilds itself. Suppliers will respond, as they have already begun to do, and the industry will stabilize over time as orders are placed and backlogs grow. This will allow the industry to grow at a rational and deliberate pace that is consistent with market realities. **This is the type of growth that will ensure the long-term health and sustainability of the nuclear industry.** An International Expansion International competition to become the global leader in commercial nuclear technology is emerging. AREVA, a French company, is not only expanding in other countries, such as the United States, but also in France, where the nation has long received 80 percent of its electricity from nuclear power. In fact, AREVA recently proposed to hire 100 retired engineers per year in France while the company trains younger talent.[32] Rolls Royce in the United Kingdom, which already has 2,000 workers in the nuclear industry, is planning to significantly increase its role; chief executive Sir John Rose said, "The expansion of the civil nuclear market represents an exciting opportunity which builds on our extensive nuclear capabilities."[33] Japan Steel Works, the world's sole supplier of the ultra-heavy large forgings, which most commercial reactors require, is also preparing to meet global demand. These forgings, which can weigh over 600 tons, are what are used to manufacture the large reactor pressure vessels, steam generators, and other components needed for a reactor.[34] Japan Steel Works invested $400 million to increase its capacity from the ability to produce about five pressure vessels a year to reach eight and a half by 2010.[35] Other companies are considering entering this market as well. The Indian manufacturer Larsen & Toubro may expand its domestic large forging capability to help meet the growing international demand.[36] Most foreign governments subsidize their national nuclear industries. However, this should not be used as a reason to justify federal government subsidies in the U.S. Indeed, it will be other countries' government support and the inefficiency that ultimately comes with it that will allow a leaner, more efficient U.S. industry to compete around the world. For that to happen, however, America's companies must have access to those foreign markets. That is why, instead of distorting investment risk through incentive programs, Congress and the Administration should be focusing on tough problems, such as how to ensure that U.S. companies can gain access to foreign markets. Conclusion While the desire to help re-establish the United States as a leader in commercial nuclear power is commendable, it is critical that congressional action not do more harm than good. That is why **Congress should not provide handouts in an attempt to spur investments in nuclear energy. Congress can best ensure the sustainability of a strong U.S. nuclear industry by simply providing a stable regulatory environment,** authorizing industry to handle its own spent nuclear fuel, and opening foreign markets. As is already becoming the trend, **the private sector will take action**.

DOD Counterplan

1NC – Counter-Plan

TEXT: The Defense Advanced Research Projects Agency should construct and operate a floating Small Modular Reactor at the Department of Defense Installation Energy Test Bed.

The test bed increases safety, overcomes barriers to deployment and commercializes SMRs

Sarewitz and Thernstrom '12 (Daniel and Samuel - Consortium for Science, Policy, and Outcomes at Arizona State University, "ENERGY INNOVATION AT THE DEPARTMENT OF DEFENSE: ASSESSING THE OPPORTUNITIES,")

The **centerpiece** of DoD's **innovation model** for facilities energy is its **Installation Energy Test Bed**. The test bed is designed to **demonstrate emerging energy technologies** in a real-world, integrated building environment in order **to reduce risk, overcome barriers to deployment, and facilitate wide-scale commercialization.** The test bed requires no new physical infrastructure; rather, it operates as a distributed activity whose key element is the **systematic evaluation of new technologies**, both to **determine their performance, operational readiness**, and life cycle costs, and to **provide guidance and design information** for future deployment across installations. The rationale is straightforward. New technologies offer the opportunity to cost-effectively reduce DoD's facility energy demand by a dramatic amount and provide distributed generation to improve energy security. Absent outside validation, however, these new technologies **will not be widely deployed in time for DoD to meet its energy goals** and requirements, for the reasons discussed earlier. Because it has such a large stock of buildings, it is in DoD's direct self-interest to help firms overcome the barriers to deployment and commercialization of their technologies. To overcome these barriers requires **demonstrations** that link emerging technology with real-world sites and end users in order to validate the technologies' cost and performance. Demonstrations can operate both as a **technology pull and a technology push**—to both accelerate the deployment of emerging technologies and foster the final development of the next generation of energy technologies. As mentioned previously, DOE has historically had limited success in playing this role, at least in part because DOE is not a market for these technologies. DoD, in contrast, is **uniquely positioned** to play this role for itself and the nation at large, due to the breadth of its infrastructure, the size of its market, and its long-established culture of test and evaluation and early technology adoption.

DARPA operations lead to commercialization and DOD adoption – avoids the free market turns

Hayward et al. '10 (Steven - American Enterprise Institute, Mark Muro - Brookings Institution, Ted Nordjaus and Michael Shellenberger - Breakthrough Institute, "How a limted a direct approach to energy innovation can deliver clean, cheap energy, economic productivity and national prosperity," http://thebreakthrough.org/blog/Post-Partisan%20Power.pdf)

In addition to fostering stronger linkages between government-funded research centers and private sector investors, entrepreneurs, and customers, the DOD can work to more closely **connect research efforts and the** growing **energy innovation** needs of the U.S. military. This close relationship between research efforts and DOD procurement and technology needs was central to the successful history of the Defense Advanced Research Projects Agency (DARPA), famous for inventing the Internet, GPS, and countless other technologies that have both improved the fighting capabilities of the U.S. military and launched many spin-off technologies American consumers and businesses now take for granted. DARPA program managers had a keen awareness of the

technologies and innovations that could improve military capabilities and funded breakthrough innovations aligned with those needs. **Once innovations matured into potentially useful technologies, the DOD was there as an early customer** for these products, allowing entrepreneurial firms to secure market demand, scale-up production, and continue to improve their products. Congress made the right move in creating and funding an Advanced Research Projects Agency for Energy (ARPA-E) program modeled after the historic success of DARPA. ARPA-E resides within the DOE, however, which is not set up to be a major user of energy technologies. By contrast, DOD has both the opportunity and the urgent need to use many of these technologies.64 The DOD can and should play a greater role in administering ARPA-E and making sure that breakthrough energy discoveries become realworld technologies that can strengthen American energy security, enhance the capabilities of the U.S. military, and spin off to broader commercial use. Fiscal year 2011 funding requests for the ARPA-E program are currently a modest $300 million, just onetenth the annual budget for DARPA research.65 Truly bringing the DARPA model to the energy sector would imply scaling ARPA-E up to match DARPA. Given the multi-trillion dollar scale of the energy industry, only funding levels on this order of magnitude will have a significant impact on the pace of energy innovation and entrepreneurship. We recommend scaling up funding for ARPA-E over the next five years to $1.5 billion annually, with a significant portion of this funding dedicated to dual-use energy technology innovations with the potential to enhance energy security and strengthen the U.S. military. DOD and DOE should extend and expand their current Memorandum of Understanding, established in July 2010,66 and launch an active partnership between ARPA-E and DOD to determine and select nascent dual-use breakthrough energy innovations for funding through the ARPA-E program and potential adoption and procurement by the DOD. 3 Reform Energy Subsidies and Use Militar y Procurement and Competitive Deployment Incentives to Drive Price Declines **The government has a long history of successfully driving innovation** and price declines in emerging technologies by acting directly as a demanding customer to spur the early commercialization and largescale deployment of cutting-edge technologies. From radios and microchips to lasers and camera lenses, the federal government, in particular the DOD, has helped **catalyze the improvement of countless innovative technologies** and supported the emergence of vibrant American industries in the process.67 Yet today's mess of **open-ended energy subsidies reward production of more of the same product, not innovation**. The federal government showers subsidies across many energy options, from oil and coal to ethanol and wind power. **None** of these efforts, however, are designed or optimized to drive and reward innovation and ensure the prices of these technologies fall over time, making the subsidies effectively permanent. This must change. Competitive Deployment Incentives The current energy subsidy and deployment framework should be turned on its head. Government investments succeed not when they are blanket subsidies but rather when they are narrowly targeted to specific outcomes, such as developing computers to allow for rocket systems, building a communications network to survive a nuclear attack, or creating increasingly efficient and powerful jet engines. These public investments paid off handsomely in personal computers, the Internet, and gas turbines used in both commercial air travel as well as modern natural gas power plants.68 In an era of expanding federal debt, across-the-board energy subsidy reform should be pursued. Incentives for energy technology deployment should be targeted and disciplined. Technologies should receive competitive deployment incentives only to the extent that they are becoming cheaper in unsubsidized terms over time. The strategy that we propose would be aimed at low-carbon technologies that, at a minimum, satisfy the following criteria: g The technology has been demonstrated and has proven technical feasibility at commercial scale; g Is currently priced above normal market rates and is locked out of markets by more mature, entrenched technology competitors; g Has potential for significant and sustained cost and performance improvements during deployment and scale-up; g#Has strong prospects for significant market penetration once the technology reaches competitive prices. Targeted and competitive deployment incentives could be created for various classes of energy technologies to ensure that each has a chance to mature. Incentive levels should fall at regular intervals, terminating if the technology class either fails to improve in price or reaches cost parity in the absence of any further incentives. Structured in this manner, reformed national energy deployment incentives will not select winners and losers, nor will it create permanently subsidized industries. These public investments will instead provide opportunity for all emerging low-carbon energy technologies to demonstrate progress toward competitive costs while increasing the rate at which early-stage clean and affordable energy technologies are commercialized. Military Procurement In addition to reforming energy deployment subsidies and launching a new competitive deployment strategy, the nation should once again leverage the power of federal procurement to establish demanding requirements to drive innovation and improvement in new energy technologies. The DOD has a long track record of using the power of procurement to successfully drive the commercialization and improvement of new technologies, many of which later spun off into broader commercial adoption. In contrast, the DOE has no way to either procure or use energy technologies at commercial scale. The DOD should help fill this void, once again using procurement to advance a range of potential dual-use energy innovations. The Pentagon's 2010 "Quadrennial Defense Review" prioritizes expanded DOD involvement in energy innovation—and with good reason.69 The U.S. military today uses more oil than Sweden and more electricity than Denmark. Every $10 increase in the price of oil costs the DOD more than $1 billion dollars, sapping money that should be used to equip our troops for critical missions at home and abroad.70 With fuel convoys costing both lives and money every day in Iraq and Afghanistan, questions of energy are understandably high on the list of Pentagon priorities, and a growing community of national security experts, including both active and retired generals and flag officers, has identified the development of new energy alternatives that can both reduce America's exposure to volatile oil markets and enhance military operational capabilities as key to securing the nation's defense.71 Congress should provide new funds necessary to secure America's energy future and national defense, providing up to $5 billion annually (as needed) to support DOD efforts to procure, demonstrate, test, validate, and improve a suite of cutting-edge energy technologies with potential to enhance American energy security or improve the strategic and tactical capabilities of the American armed forces. Energy technologies with clear dual-use commercial and military potential well suited to DOD procurement could include: advanced biofuels, including aviation fuels; advanced solar thermal and photovoltaic power technologies; improved batteries; electric vehicles; and new, modular nuclear reactors (discussed in greater detail below). As discussed above, DOD should work closely with ARPA-E and other research initiatives in both DOD and DOE to ensure a steady flow of energy innovation geared towards military needs. Procurement contracts should require continued innovation and cost improvements from supplying firms and should be competitively awarded. New efforts should be

pursued to ensure that innovative firms both large and small can participate in procurement contracts and the military can benefit from the best American innovations, no matter where they arise.72 Embrace the Potential of Nuclear — But Pursue a Portfolio A new generation of smaller, innovative nuclear reactors holds great promise in providing affordable, reliable, zero-carbon power and heat to utilities of all sizes, industrial facilities, and military bases. For decades, small reactors between one-tenth to one-twentieth the size of existing commercial nuclear plants have powered U.S. aircraft carriers and submarine fleets. New modular commercial reactor designs based on the same reliable technology are smaller, safer, and less expensive than older designs and have the potential to be affordably mass-manufactured. Such technologies also offer the possibility of greater applicability globally and could potentially represent a new high-value, export-oriented manufacturing industry for the U.S. economy. A new generation of more advanced designs may hold even greater promise for the future.73 Modular reactor designs should receive priority attention from the Departments of Energy and Defense, who can each work to research advanced reactor technologies, license and approve new commercial modular reactor designs, and procure and **demonstrate small modular reactors at** DOE nuclear facilities and **DOD military bases**.

Accelerating SMR development will cause devastating accidents

Wang '12 (Ucilia, Forbes, 1-20, "Feds To Finance Small Nuclear Reactor Designs," http://www.forbes.com/sites/uciliawang/2012/01/20/feds-to-finance-small-nuclear-reactor-designs/)

Just because small nuclear reactors promise many economic and environmental benefits (they don't produce dirty air like coal or natural gas power plants do) doesn't mean they can be developed and made more quickly or cheaply, however. Technology companies also will have to prove that their small nuclear reactors can be just as safe if not safer than the conventional, large-scale nuclear reactors today. The Fukushima nuclear power plant disaster in Japan has shown that a **misstep in designing and operating** a nuclear plant can have a far greater and more **devastating impact** than a mistake in running other types of power plants. That means nuclear power companies – and the government – **will have to do a lot more** to prove that nuclear power should remain an important part of the country's energy mix.

Accidents turn case – kills SMR industry

Reynolds '10 - Mechanical Engineering Professor WSU Tri-Cities (Roger S., "APPLICABILITY OF THE NRC LIGHT WATER REACTOR LICENSING PROCESS TO SMRs," July 2010, https://smr.inl.gov/Document.ashx?path=DOCS%2fReading+Room%2fPolicy+and+regulation%2fANS+SMR+APPLICABILITY+OF+THE+NRC+LWR+LICENSING+PROCESS+910.pdf)

Small and Medium Sized Reactors (**SMRs) of a Light Water design** differ in important ways from each other and from the current fleet of operating reactors. These designs **incorporate innovative approaches to achieve simplicity, improved operational performance, and enhanced safety**. **Gas-cooled and liquid metal–cooled reactors represent an even greater departure from current designs and consequently greater challenges to the application of current regulatory guidance**. Several of the most challenging issues have been identified and analyzed in recent years. The next section of this paper will discuss this history in some detail. **If SMR licensing is to succeed, these issues must be resolved to the satisfaction of the NRC and the public**.

Solvency

2NC Solvency Overview

The counterplan has

DARPA testing has empirically gradually eroded DOD opposition to new technology – the CP mechanism alone provides cover for SMR adoption

Sarewitz and Thernstrom 12 (Daniel and Samuel - Consortium for Science, Policy, and Outcomes at Arizona State University, "ENERGY INNOVATION AT THE DEPARTMENT OF DEFENSE: ASSESSING THE OPPORTUNITIES,")

DARPA at times has invaded the territory occupied by powerful companies or bureaucracies. It drove the desktop personal computing and the Internet model against the IBM mainframe model. On the military side of the ledger, cooperating with others in DoD, it drove stealth, unmanned systems, and precision strike and night vision capabilities— **despite the lack of interest from and even express objections of the military** services. At times these "invasions" have taken special mechanisms beyond or outside of (but in coordination with) DARPA to achieve. On militarily specific technologies DARPA operates under a motif that is expressly separated and different from that of the military services; DARPA focuses more on **breakthroughs** and does not work on projects directly related to existing, expressly stated military requirements, which are inherently shorter term and engineering oriented. Thus, the concepts and technologies that DARPA explores provide capabilities that usually challenge and even disrupt the services' technology development and implementation interests. DARPA does try to involve the service R&D communities as prospective "customers" of its R&D as a means to foster transition. But for technology developments that are outside the usual systems that the services employ, transition often has been difficult and has required the involvement of executives from the highest levels of the OSD. This was the case for stealth aviation, unmanned aerial vehicles (UAVs), and standoff precision strike. The involvement of higher-level OSD officials has been required to **overcome the services' uneasiness about bringing** fundamentally **new** and different **concepts into an existing operational environment**, with the attendant **risks and costs**. One OSD effort to **overcome** these risk actors was the Advanced Concept **Technology Demonstration program** within OSD that explicitly began as a means to get advanced, prototype UAVs, such as Predator, into experimental use in actual military operations. Another example of high-level OSD involvement was then–under secretary for defense research and engineering William Perry managing the implementation of the F-117A stealth program directly out of his office.

2NC – Solvency – DARPA – DOD/Commercialization

DARPA operations lead to commercialization and DOD adoption – avoids the free market turns

Hayward et al. 10 (Steven - American Enterprise Institute, Mark Muro - Brookings Institution, Ted Nordjaus and Michael Shellenberger - Breakthrough Institute, "How a limted a direct approach to energy innovation can deliver clean, cheap energy, economic productivity and national prosperity," http://thebreakthrough.org/blog/Post-Partisan%20Power.pdf)

In addition to fostering stronger linkages between government-funded research centers and private sector investors, entrepreneurs, and customers, the DOD can work to more closely **connect research efforts and the** growing **energy innovation** needs of the U.S. military. This close relationship between research efforts and DOD procurement and technology needs was central to the successful history of the Defense Advanced Research Projects Agency (DARPA), famous for inventing the Internet, GPS, and countless other technologies that have both improved the fighting capabilities of the U.S. military and launched many spin-off technologies American consumers and businesses now take for granted. DARPA program managers had a keen awareness of the technologies and innovations that could improve military capabilities and funded breakthrough innovations aligned with those needs. **Once innovations matured into potentially useful technologies, the DOD was there as an early customer** for these products, allowing entrepreneurial firms to secure market demand, scale-up production, and continue to improve their products. Congress made the right move in creating and funding an Advanced Research Projects Agency for Energy (ARPA-E) program modeled after the historic success of DARPA. ARPA-E resides within the DOE, however, which is not set up to be a major user of energy technologies. By contrast, DOD has both the opportunity and the urgent need to use many of these technologies.64 The DOD can and should play a greater role in administering ARPA-E and making sure that breakthrough energy discoveries become realworld technologies that can strengthen American energy security, enhance the capabilities of the U.S. military, and spin off to broader commercial use. Fiscal year 2011 funding requests for the ARPA-E program are currently a modest $300 million, just onetenth the annual budget for DARPA research.65 Truly bringing the DARPA model to the energy sector would imply scaling ARPA-E up to match DARPA. Given the multi-trillion dollar scale of the energy industry, only funding levels on this order of magnitude will have a significant impact on the pace of energy innovation and entrepreneurship. We recommend scaling up funding for ARPA-E over the next five years to $1.5 billion annually, with a significant portion of this funding dedicated to dual-use energy technology innovations with the potential to enhance energy security and strengthen the U.S. military. DOD and DOE should extend and expand their current Memorandum of Understanding, established in July 2010,66 and launch an active partnership between ARPA-E and DOD to determine and select nascent dual-use breakthrough energy innovations for funding through the ARPA-E program and potential adoption and procurement by the DOD. 3 Reform Energy Subsidies and Use Militar y Procurement and Competitive Deployment Incentives to Drive Price Declines **The government has a long history of successfully driving innovation** and price declines in emerging technologies by acting directly as a demanding customer to spur the early commercialization and largescale deployment of cutting-edge technologies. From radios and microchips to lasers and camera lenses, the federal government, in particular the DOD, has helped **catalyze the improvement of countless innovative technologies** and supported the emergence of vibrant American industries in the process.67 Yet today's mess of **open-ended energy subsidies reward production of more of the same product, not innovation**. The federal government showers subsidies across many energy options, from oil and coal to ethanol and wind power. **None** of these efforts, however, are designed or optimized to drive and reward innovation and ensure the prices of these technologies fall over time, making the subsidies effectively permanent. This must change. Competitive Deployment Incentives The current energy subsidy and deployment framework should be turned on its head. Government investments succeed not when they are blanket subsidies but rather when they are narrowly targeted to specific outcomes, such as developing computers to allow for rocket systems, building a communications network to survive a nuclear attack, or creating increasingly efficient and powerful jet engines. These public investments paid off handsomely in personal computers, the Internet, and gas turbines used in both commercial air travel as well as modern natural gas power plants.68 In an era of expanding federal debt, across-the-board energy subsidy reform should be pursued. Incentives for energy technology deployment should be targeted and disciplined. Technologies should receive competitive deployment incentives only to the extent that they are becoming cheaper in unsubsidized terms over time. The strategy that we propose would be aimed at low-carbon technologies that, at a minimum, satisfy the following criteria: g The technology has been demonstrated and has proven technical feasibility at commercial scale; g Is currently priced above normal market rates and is locked out of markets by more mature, entrenched technology competitors; g Has potential for significant and sustained cost and performance improvements during deployment and scale-up; g#Has strong prospects for significant market penetration once the technology reaches competitive prices. Targeted and competitive deployment incentives could be created for various classes of energy technologies to ensure that each has a chance to mature. Incentive levels should fall at regular intervals, terminating if the technology class either fails to improve in price or reaches cost parity in the absence of any further incentives. Structured in this manner, reformed national energy deployment incentives will not select winners and losers, nor will it create permanently subsidized industries. These public investments will instead provide opportunity for all emerging low-carbon energy technologies to demonstrate progress toward competitive costs while increasing the rate at which early-stage

clean and affordable energy technologies are commercialized. Military Procurement In addition to reforming energy deployment subsidies and launching a new competitive deployment strategy, the nation should once again leverage the power of federal procurement to establish demanding requirements to drive innovation and improvement in new energy technologies. The DOD has a long track record of using the power of procurement to successfully drive the commercialization and improvement of new technologies, many of which later spun off into broader commercial adoption. In contrast, the DOE has no way to either procure or use energy technologies at commercial scale. The DOD should help fill this void, once again using procurement to advance a range of potential dual-use energy innovations. The Pentagon's 2010 "Quadrennial Defense Review" prioritizes expanded DOD involvement in energy innovation—and with good reason.69 The U.S. military today uses more oil than Sweden and more electricity than Denmark. Every $10 increase in the price of oil costs the DOD more than $1 billion dollars, sapping money that should be used to equip our troops for critical missions at home and abroad.70 With fuel convoys costing both lives and money every day in Iraq and Afghanistan, questions of energy are understandably high on the list of Pentagon priorities, and a growing community of national security experts, including both active and retired generals and flag officers, has identified the development of new energy alternatives that can both reduce America's exposure to volatile oil markets and enhance military operational capabilities as key to securing the nation's defense.71 Congress should provide new funds necessary to secure America's energy future and national defense, providing up to $5 billion annually (as needed) to support DOD efforts to procure, demonstrate, test, validate, and improve a suite of cutting-edge energy technologies with potential to enhance American energy security or improve the strategic and tactical capabilities of the American armed forces. Energy technologies with clear dual-use commercial and military potential well suited to DOD procurement could include: advanced biofuels, including aviation fuels; advanced solar thermal and photovoltaic power technologies; improved batteries; electric vehicles; and new, modular nuclear reactors (discussed in greater detail below). As discussed above, DOD should work closely with ARPA-E and other research initiatives in both DOD and DOE to ensure a steady flow of energy innovation geared towards military needs. Procurement contracts should require continued innovation and cost improvements from supplying firms and should be competitively awarded. New efforts should be pursued to ensure that innovative firms both large and small can participate in procurement contracts and the military can benefit from the best American innovations, no matter where they arise.72 Embrace the Potential of Nuclear — But Pursue a Portfolio A new generation of smaller, innovative nuclear reactors holds great promise in providing affordable, reliable, zero-carbon power and heat to utilities of all sizes, industrial facilities, and military bases. For decades, small reactors between one-tenth to one-twentieth the size of existing commercial nuclear plants have powered U.S. aircraft carriers and submarine fleets. New modular commercial reactor designs based on the same reliable technology are smaller, safer, and less expensive than older designs and have the potential to be affordably mass-manufactured. Such technologies also offer the possibility of greater applicability globally and could potentially represent a new high-value, export-oriented manufacturing industry for the U.S. economy. A new generation of more advanced designs may hold even greater promise for the future.73 Modular reactor designs should receive priority attention from the Departments of Energy and Defense, who can each work to research advanced reactor technologies, license and approve new commercial modular reactor designs, and procure and **demonstrate small modular reactors at** DOE nuclear facilities and **DOD military bases**.

2NC – Solvency – DARPA – Commercialization

DARPA demonstrations spark commercialization – operates at the frontend of the innovation process

Sarewitz and Thernstrom 12 (Daniel and Samuel - Consortium for Science, Policy, and Outcomes at Arizona State University, "ENERGY INNOVATION AT THE DEPARTMENT OF DEFENSE: ASSESSING THE OPPORTUNITIES,")

Role as First Adopter/Initial-Market Creator In addition to ties to **demonstration capabilities**, DARPA has undertaken a **technology** insertion or **adoption role**. In coordination with other parts of DoD, it has been able to create **initial** or first **markets** for its **new technologies**. Ties to Leadership DARPA has been particularly **effective** when it is tied to senior leaders who can effectuate its technologies through DoD or elsewhere. Because DARPA operates at the **front end of the innovation process**, it historically has required ties to senior DoD leaders to align with the follow-on back end of the innovation system.

2NC – Solvency – DOD – Commercialization

DOD SMR testing commercialize the market – sparks widespread adoption of SMRs – Avoids the links to all the net benefits

Andres and Breetz 11 [Richard B. andres is Professor of national Security Strategy at the national War College and a Senior fellow and energy and environmental Security and Policy Chair in the Center for Strategic research, institute for national Strategic Studies, at the national Defense University. Hanna L. Breetz is a doctoral candidate in the Department of Political Science at the Massachusetts institute of technology. Small Nuclear Reactors for Military Installations: Capabilities, Costs, and Technological Implications, Institute for National Strategic Studies, http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA545712]

DOD as First Mover Thus far, this paper has reviewed two of DOD's most pressing energy vulnerabilities—grid insecurity and fuel convoys—and explored how they could be addressed by small reactors. We acknowledge that there are many **uncertainties and risks** associated with these reactors. On the other hand, failing to pursue these technologies raises its own set of risks for DOD, which we review in this section: first, small reactors may fail to be commercialized in the United States; second, the designs that get locked in by the private market may not be optimal for DOD's needs; and third, expertise on small reactors may become concentrated in foreign countries. By taking an early "**first mover" role** in the small reactor market, DOD could **mitigate** these **risks** and secure the long-term availability and appropriateness of these technologies for U.S. military applications. The "Valley of Death." Given the promise that small reactors hold for military installations and mobility, DOD has a compelling interest in ensuring that they make the leap from paper to production. However, **if DOD does not provide an initial demonstration and market, there is a chance that the U.S. small reactor industry may never get off the ground**. The leap from the laboratory to the marketplace is so difficult to bridge that it is widely referred to as the "Valley of Death." Many promising technologies are never commercialized due to a variety of market failures— including **technical and financial uncertainties, information asymmetries, capital market imperfections, transaction costs**, and environmental and security externalities—that impede financing and early adoption and can lock innovative technologies out of the marketplace. 28 In such cases, the Government can help a worthy technology to bridge the Valley of Death by accepting the first mover costs and **demonstrating the technology's scientific and economic viability**.29 Historically, nuclear power has been "the most clear-cut example . . . of an important general-purpose technology that in the absence of military and defenserelated procurement would not have been developed at all."30 Government involvement is likely to be crucial for innovative, next-generation nuclear technology as well. Despite the widespread revival of interest in nuclear energy, Daniel Ingersoll has argued that radically innovative designs face an uphill battle, as "the high capital cost of nuclear plants and the painful lessons learned during the first nuclear era have created **a prevailing fear of first-of-a-kind designs**."31 In addition, Massachusetts Institute of Technology reports on the Future of Nuclear Power called for the Government to provide modest "first mover" assistance to the private sector due to several barriers that have hindered the nuclear renaissance, such as securing high up-front costs of site-banking, gaining NRC certification for new technologies, and demonstrating technical viability.32 It is possible, of course, that small reactors will achieve commercialization without DOD assistance. As discussed above, they have garnered increasing attention in the energy community. Several analysts have even argued that small reactors could play a key role in the second nuclear era, given that they may be the only reactors within the means of many U.S. utilities and developing countries.33 However, given the **tremendous regulatory hurdles and technical and financial uncertainties**, it appears **far from certain** that the U.S. small reactor industry will take off. If DOD wants to ensure that small reactors are available in the future, then **it should pursue** a **leadership** role **now**.

DOD leadership catalyzes the SMR industry – key to making it commercially viable

Andres and Breetz 11 Richard B, Professor of National Security Strategy at the National War College and a Senior Fellow and Energy and Environmental Security and Policy Chair in the Center for Strategic Research, Institute for National Strategic Studies, at the National Defense University and Hanna L, doctoral candidate in the Department of Political Science at The Massachusetts Institute of Technology,

February, "Small Nuclear Reactors for Military Installations: Capabilities, Costs, and Technological Implications", www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf

The preceding analysis suggests that DOD should seriously consider taking a **leadership role** on small reactors. This new technology has the potential to solve two of the most serious energy-related problems faced by the department today. Small reactors could island domestic military bases and nearby communities, thereby protecting them from grid outages. They could also drastically reduce the need for the highly vulnerable fuel convoys used to supply forward operating bases abroad. ¶ The technology being proposed for small reactors (much of which was originally developed in U.S. Government labs) is promising. A number of the planned designs are self-contained and highly mobile, and could meet the needs of either domestic or forward bases. Some promise to be virtually impervious to accidents, with design characteristics that might allow them to be used even in active operational environments. These reactors are potentially safer than conventional light water reactors. The argument that this technology could be useful at domestic bases is virtually unassailable. The argument for using this technology in operational units abroad is less conclusive; however, because of its potential to save lives, it warrants serious investigation.¶ Unfortunately, the technology for these reactors is, for the most part, caught between the drawing board and production. Claims regarding the field utility and safety of various reactors are plausible, but authoritative evaluation will require substantial investment and technology demonstration. In the U.S. market, DOD could play an important role in this area. In the event that the U.S. small reactor industry succeeds without DOD support, the types of designs that emerge might not be useful for the department since some of the larger, more efficient designs that have greater appeal to private industry would not fit the department's needs. Thus, there is significant incentive for **DOD to intervene** to provide a market, both to **help the industry survive and to shape its direction**.¶ Since the 1970s, in the United States, only the military has overcome the considerable barriers to building nuclear reactors. This will probably be the case with small reactors as well. If DOD leads as a **first mover** in this market—initially by providing analysis of costs, staffing, reactor lines, and security, and, when possible, **by moving forward with a pilot installation**—the new technology will likely survive and be applicable to DOD needs. **If DOD does not, it is possible the technology will be unavailable** in the future for either U.S. military or commercial use.

DOD investment in SMRs causes spill over – assumes their solvency deficits

Daniel **Sarewitz 12**, Co-Director, Consortium for Science, Policy and Outcomes, Arizona State University; and Samuel Thernstrom Senior Climate Policy Advisor, Clean Air Task Force, March 2012, "Energy Innovation at the Department of Defense: Assessing the Opportunities," p. 3

DoD's ability to house **supply and demand under one roof**, and to **produce lasting improvements** in complex systems over time, driven in part by large, sustained procurement programs, is nearly unique—and unlikely to be widely reproduced in the energy and climate context. There are significant constraints upon what DoD is likely to do directly in this area; the department is unlikely to become an all-purpose engine of energy innovation. Instead, it must be assumed that DoD innovation efforts will focus on technologies that are most likely to contribute to the military's mission. The extent to which these technologies have the potential to **catalyze innovation** relevant to large-scale reduction of global greenhouse gas emissions remains to be seen. An important open question in this regard is the degree to which DoD will see zero carbon baseload energy generation for its fixed installations as an area worthy of investments. For example, the development and deployment of advanced nuclear reactor designs such as small modular reactors is one potentially important opportunity to advance both military and civilian interests. The Challenge One challenge for policymakers concerned about energy and climate, then, is to maximize the ways in which DoD can contribute directly to progress on key energy-related technologies in ways that advance, or at least do not impede, the security mission. But policymakers must also think seriously about the ways in which the DoD **innovation model** can be applied beyond its institutional borders, and about what the DoD experience suggests with regards to the prospects for other proposals to enhance our national energy innovation systems.

2NC – Solvency – DOD Test Bed – Barriers/Commercialization

DOD Test-bed projects solve – overcomes barriers and creates momentum for SMR development for the military

Matt **Stepp et al. 11**, specialist in clean energy innovation at the Information Technology and Innovation Foundation, formerly Fellow at the Breakthrough Institute, et al, May 2011, "Ten Principles for Creating a New U.S. Clean Energy Policy," http://www.itif.org/files/2011-guiding-principles.pdf

Clean energy innovation includes bridging technologies across the "valleys of death." The first valley of death – the phase in development between R&D and prototyping the first generation of a technology – is crucially important because it takes the innovation out of the lab and proves its commercial viability. But building the first prototype of a radically new solar installation or demonstrating a new small modular nuclear reactor is **capital intensive and risky**. Because of this, the private sector has historically provided little support for this stage of development and would rather wait until new technologies yield a higher rate of return. So the federal government has played a **significant role** in developing many of the last century's breakthrough technologies through demonstration and **test-bed projects**. Past breakthrough technologies like the Internet, nuclear power plants, and jet engines were initially built and tested at federal labs and through private sector collaborations with the military. Currently, the United States is just beginning to implement strategies for bridging technologies from the lab to demonstration, such as through the agreement between ARPA-E and the **Department of Defense to test** advanced **energy technologies suitable for the militaries needs**. But these policies are not permanent, as they are enforced at the agency level without a national strategy or Congressional mandate.

Net-Benefits

2NC – Gradual Distinction

DARPA testing solves commercialization and gradually builds military support for energy technology – innovation creates confidence in new technologies within the DOD

Sarewitz and Thernstrom 12 (Daniel and Samuel - Consortium for Science, Policy, and Outcomes at Arizona State University, "ENERGY INNOVATION AT THE DEPARTMENT OF DEFENSE: ASSESSING THE OPPORTUNITIES,")

DARPA has repeatedly launched related technologies that complement each other and that help **build support** for the **commercialization or implementation** of one another. This concept of complementary technologies also ties to the notion of program thrusts. One way of thinking about this is that DARPA is not in the "thing" business—it is in the problem-solving business. While a specific innovation may have a major impact, it is unlikely that one such project by itself will adequately address a major challenge or problem. While DARPA may support an **individual invention**, it usually does so because that invention may be an element of an **overall solution to a challenge**. Confluence with an Advocate Community DARPA has spawned new economic sectors; these have in turns spawned new firms, which have garnered support from venture capital (VC). Accordingly, DARPA has been able to make its advances reinforce each other; it has been able to **play an intermediary role with industry in part by building an advocate community across sectoral lines**. A key element of DARPA's success in such areas as information technology, sensor systems, advanced materials, and directed **energy systems** is building the community of "**change agents**"—a broad community **fostered over time from** its program managers, from "graduates" of the DARPA program who go on to **roles in** academia and **industry**, and from contractors in universities and industry trained in the DARPA model and technology approaches. Connection to Larger Innovation Elements Going beyond the confluence with its support community, DARPA has been an actor within **larger innovation efforts**; it is often instrumental, but seldom a sole actor. This connection to larger innovation elements is important to DARPA's effectiveness because it does not have its own research facilities, and its program managers do not perform their own research. Thus, the DARPA PM's most important function is to identify and support those who have the potentially disruptive, change-state ideas and who will ably perform the necessary research. Thus, the PM is an opportunity creator and idea harvester within an emerging technology field. From this concept- or idea-scouting perspective DARPA has spawned a group of researchers, and from that, new firms that act to help effectuate the program's overall vision. However, this downward and outward linking into the research community and commercial industry is only one aspect of DARPA's connectivity to larger innovation elements. DARPA, as an agency of the Department of Defense, is part of a **broader innovation structure** within and for DoD. Crucial here is that DARPA is an independent organization under the secretary of defense and is explicitly separate from the military service acquisition system. While the secretary of defense and the underlying Office of the Secretary of Defense (OSD) bureaucracy rarely directly involve themselves in DARPA's individual research programs, OSD leadership elements at various times have played a strong role in identifying the mission challenges they want DARPA to address. Thus, DARPA, working with OSD, has been able to **tie its advances to the larger innovation elements in DoD**, often **implementing its technologies through service procurement programs**.

2NC – Free Market – OV Cards

DOD projects are a market goldilocks - anything other than a demonstration project risk market distortion or under-confidence in the private sector- both turn case

- **Key to not bankrupt the government- the impact is the budget internal link**
- **Key to Carbon Sequestration innovation- the impact is the warming advantage**
- **DOD key- other actors are demonstrating in the status quo- DOD alone solves**

CSPO/CATF '9 (A Joint Project of CSPO AND CATF, INNOVATION AND POLICY CORE GROUP Jane "Xan" Alexander Independent Consultant D. Drew Bond Vice President, Public Policy, Battelle David Danielson Partner, General Catalyst Partners David Garman Principal, Decker Garman Sullivan and Associates, LLC Brent Goldfarb Assistant Professor of Management and Entrepreneurship, University of Maryland David Goldston Bipartisan Policy Center; Visiting Lecturer on Environmental Science and Public Policy, Harvard University David Hart Associate Professor, School of Public Policy, George Mason University Michael Holland Program Examiner, Office of Management and Budget Suedeen Kelly Commissioner, Federal Energy Regulatory Commission Jeffrey Marqusee Director, Environmental Security Technology Certification Program, and Technical Director, Strategic Environmental Research and Development Program, Department of Defense Tony Meggs MIT Energy Initiative Bruce Phillips Director, The NorthBridge Group Steven Usselman Associate Professor, School of History, Technology, and Society, Georgia Tech Shalini Vajjhala Fellow, Resources for the Future Richard Van Atta Core Research Staff Member for Emerging Technologies and Security, Science and Technology Policy Institute PV TECHNICAL EXPERTS Dan Shugar President, SunPower Corporation, Systems Tom Starrs Independent Consultant Trung Van Nguyen Director, Energy for Sustainability Program, National Science Foundation Ken Zweibel Director, Institute for Analysis of Solar Energy, George Washington University PCC TECHNICAL EXPERTS Howard Herzog Principal Research Engineer, MIT Laboratory for Energy and the Environment Pat Holub Technical and Marketing Manager, Gas Treating, Huntsman Corporation Gary Rochelle Carol and Henry Groppe Professor in Chemical Engineering, University of Texas at Austin Edward Rubin Alumni Professor of Environmental Engineering and Science; Professor of Engineering & Public Policy and Mechanical Engineering, Carnegie Mellon University AIR CAPTURE TECHNICAL EXPERTS Roger Aines Senior Scientist in the Chemistry, Materials, Earth and Life Sciences Directorate, Lawrence Livermore National Laboratory David Keith Director, Energy and Environmental Systems Group Institute for Sustainable Energy, Environment and Economy, University of Calgary Klaus Lackner Ewing-Worzel Professor of Geophysics, Department of Earth and Environmental Engineering, Columbia University Jerry Meldon Associate Professor of Chemical and Biological Engineering, Tufts University Roger Pielke, Jr. Professor, Environmental Studies Program, and Fellow of the Cooperative Institute for Research in Environmental Sciences, University of Colorado OTHER PARTICIPANTS Keven Brough CCS Program Director, ClimateWorks Foundation Mike Fowler Technical Coordinator Coal Transition Project, Clean Air Task Force Nate Gorence Policy Analyst, National Commission on Energy Policy Melanie Kenderdine Associate Director for Strategic Planning, MIT Energy Initiative Michael Schnitzer Director, The NorthBridge Group Kurt Waltzer Carbon Storage Development Coordinator, Coal Transition Project, Clean Air Task Force Jim Wolf Doris Duke Charitable Foundation, "Innovation Policy for Climate Change", http://www.cspo.org/projects/eisbu/report.pdf, September 2009,)

o **To stimulate commercialization, policy makers must recognize the crucial role of demonstration projects in energy-climate innovation, especially for technologies with potential applications in the electric utility industry. Government-sponsored demonstration programs have a long-established place in U.S. technology and innovation policy, but a poor reputation in energy. Since the primary purpose of demonstrations is to reduce technical and cost uncertainties, the private sector should be chiefly responsible for managing demonstrations, with government providing financial support, disseminating results openly, and ensuring a level competitive playing field. Well-planned and conducted programs could push forward technologies such as CO2 capture from power plants. While, for example, the DOE has supported** exploratory R&D on advanced **coal-burning power generation for several decades, it has largely ignored the issues raised by controlling CO2 from the nation's existing** coal-fired **power plants, which produce over onethird of U.S. CO2 emissions.** Technologies exist for capturing CO2 from such plants, but they have not been tested at full plant scale. o **To catalyze and accelerate innovation, government should become a major consumer of innovative energy technology products and systems. DoD procurement has been an enormously powerful influence on innovation across important areas of**

advanced technology from electronics to aerospace to info-tech. **In contrast, the U.S. government has not systematically and strategically used its purchasing power to foster energy-related innovations**. **Yet each year, federal, state, and local governments spend large sums on goods and services with implications for GHG release and climate change,** including office buildings, motor vehicles, and transit systems. **Government can be a "smarter customer" for energy-climate innovations, helping to create early markets, driving competition among firms, and fostering confidence in advanced technologies, including those that are not yet price-competitive in the open market**. Like other aspects of U.S. energy and climate policy, **the nation's approach to energy-climate innovation has lacked a clear mission and strategy**. Most attention and discussion has focused on advanced research, yet **most innovation in the coming decades will depend much less on frontier research than on other available and proven tools**. (Indeed, **in none of our workshops did "more research" surface as the major concern—not even for air capture, which**, though radical in concept, **is based on well-understood concepts and processes**.) We know what works, based on the past 60 years and more of experience, but so far we have not used what we know to address energy technologies and climate change. We know, for example, that **technological advances come largely from industry—but that government can catalyze**, and even create, **new waves of industrial innovation by supporting the technology base, providing incentives** (such as those that have been so effective in expanding the market for PV systems), **and deploying its purchasing power**. By treating climate mitigation as a public good and GHG reduction as a public works endeavor, **the United States can rapidly strengthen the linkages between public investment and private sector innovation, and begin to lead other countries toward building energy-climate technologies into the fabric of their innovation systems**, their economies, and their societies.

Acquisition through financial incentives turns the case and wrecks spin-off innovation

Loris 11 Nicolas Loris is an analyst in the Heritage Foundation's Roe Institute of Economic Policy Studies. "Power Down the Subsidies to Energy Producers" Aug 3 www.heritage.org/research/commentary/2011/08/power-down-the-subsidies-to-energy-producers

America has an energy addiction - and it's not an addiction to oil, as many politicians would have you think. It's an **addiction to government subsidies**. The addicts, you see, are energy producers, not the consumers. Their **growing dependence on federal handouts is the real cause of America's energy crisis.** Energy subsidies have needlessly wasted taxpayer dollars, **retarded commercialization of new technologies** and failed to reduce our reliance on foreign energy sources. Washington would do well to end all energy subsidies. Energy subsidies come in numerous forms ranging from direct expenditures to targeted tax breaks, from production mandates to loan guarantees. Basically, any public policy that favors the production or consumption of one type of energy over another can be considered a subsidy. None of them come cheap. According to the Energy Information Agency, the federal government gave the energy industry $8.2 billion in subsidies and financial aid in 1999. This figure more than doubled to $17.9 billion in 2007 and more than doubled again to $37.2 billion last year. But the damage subsidies inflict on our economy extends **well beyond direct costs**. A special endorsement from the government **artificially props up that technology**. This **reduces the incentive** for the producer to become **cost-competitive, stifles innovation** and **encourages government dependence**. The federal government has **no business picking commercial winners and losers**. That's the job of the marketplace. Indeed, it's doubly damaging when government decides to **manipulate the market through subsidies**, because government - almost invariably - **picks losers**. That's not surprising, because companies that seek handouts most strenuously are those that cannot compete without them.

Tech innovation key to solve great power wars

Baru 9 Sanjaya is a Professor at the Lee Kuan Yew School in Singapore Geopolitical Implications of the Current Global Financial Crisis, Strategic Analysis, Volume 33, Issue 2 March 2009 , pages 163 – 168

Hence, economic policies and performance do have **strategic consequences**.2 In the modern era, the idea that strong **economic performance is the foundation of power** was argued most persuasively by historian Paul Kennedy. 'Victory (in war)', Kennedy claimed, 'has repeatedly gone to the side with more flourishing productive base'.3 Drawing attention to the interrelationships between **economic wealth, technological innovation, and the ability of states to efficiently mobilize economic and technological resources for power projection** and national defence, Kennedy argued that nations that were able to better combine military and economic strength scored over others. 'The fact remains', Kennedy argued, 'that all of the major shifts in the world's military-power balance have followed alterations in the productive balances; and further, that the rising and falling of the various empires and states in the international system has been confirmed by the outcomes of the major **Great Power wars**, where victory has always gone to the side with the greatest material resources'.4 In Kennedy's view, the geopolitical consequences of an economic crisis, or even decline, would be transmitted through a nation's inability to find adequate financial resources to **simultaneously sustain economic growth and military power**.

2NC – Free Market – CP Shields

DOD procurement solves market innovation ---- empirically creates and drives market confidence

COHEN et al '9 - co-founder and Executive Director of the Clean Air Task Force; honors graduate of Harvard Law School; led the Conservation Law Foundation's Energy Project (Cohen, Armond. "Innovation Policy for Climate Change". September, 2009. http://www.cspo.org/projects/eisbu/report.pdf)

o **To catalyze and accelerate innovation, government should become a major consumer of innovative energy technology products and systems**. **DoD procurement has been an** enormously powerful influence on innovation **across important areas of advanced technology** from electronics **to aerospace** to info-tech. **In contrast, the U.S. government has not systematically and strategically used its purchasing power to foster energy-related innovations**. Yet each year, federal, state, and local governments spend large sums on goods and services with implications for GHG release and climate change, including office buildings, motor vehicles, and transit systems. **Government can be a "smarter customer" for energy-climate innovations, helping to** create **early** markets, driving competition **among firms,** and fostering confidence **in advanced technologies**, including those that are not yet price-competitive in the open market. Like other aspects of U.S. energy and climate policy, the nation's approach to energy-climate innovation has lacked a clear mission and strategy. Most attention and discussion has focused on advanced research, yet most innovation in the coming decades will depend much less on frontier research than on other available and proven tools. (Indeed, in none of our workshops did "more research" surface as the major concern—not even for air capture, which, though radical in concept, is based on well-understood concepts and processes.) We know what works, based on the past 60 years and more of experience, but so far we have not used what we know to address energy technologies and climate change. We know, for example, that technological advances come largely from industry—but that **government can** catalyze, **and even create,** new waves of **industrial innovation by supporting the technology base, providing incentives** (such as those that have been so effective in expanding the market for PV systems), **and deploying its purchasing power**. By treating climate mitigation as a public good and GHG reduction as a public works endeavor, **the U**nited **S**tates can rapidly strengthen the linkages between public investment and private sector innovation, and begin to lead other countries toward building energy-climate technologies into the fabric of their innovation systems, their economies, and their societies.

DOD acts as a test bed for commercialization – spills over into market innovation

SAREWITZ AND THERNSTROM '12 – Sarewitz -- Director of the Consortium for Science, Policy and Outcomes; Ph.D. in Geological Sciences Cornell Universitywas the director of the Geological Society of America's Institute for Environmental EducationCongressional Science Fellow ***AND Thernstrom --- resident fellow and the co-director of the Geo-engineering Project at the American Enterprise Institute; served on the White House Council on Environmental Quality (Sarewitz, Daniel. Samuel Thernstrom. "Energy Innovation at the Department Of Defense Assessing the Opportunities". March, 2012. http://www.scribd.com/doc/95195198/Energy-Innovation-at-the-Department-of-Defense-Assessing-the-Opportunities)

The American military's 500-plus **bases**, depots, and other real estate holdings in the United States and abroad, mostly well removed from zones of conflict and some of them resembling small cities, **get their energy—electricity, natural gas, gasoline for passenger vehicles—chiefly from commercial suppliers**. **Among energy sources, electrical power is critical**. DoD depends on computer and communications networks numbering in the thousands. Most rely on civilian infrastructure for electrical power and voice/data links. So long as backup power is available (e.g., from diesel generators), essential communications and other C4ISR (Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance), functions can be maintained. Smart-grid technologies that automatically isolate and reconfigure DoD's most critical networks during blackouts and other emergencies have been of particular interest to those who oversee the military's energy infrastructure. Other fixed-base energy concerns emphasize costs and conservation. **DoD's stock of buildings numbers over 300,000**. As discussed by Jeffrey Marqusee in his white paper, "Military Installations and Energy Technology Innovation," **DoD expects to substantially reduce facilities,**

energy demand, in part by acting as an innovation test bed, identifying the best new technologies, and accelerating adoption. Important as these efforts may be, they affect only about one-quarter of DoD energy usage. The rest is consumed in operations, mostly by what DoD calls platforms— ships, aircraft, and ground vehicles.

DOD causes spinoff innovation – drives momentum in the market as opposed to distortion with financial incentives

COHEN et al '9 - co-founder and Executive Director of the Clean Air Task Force; honors graduate of Harvard Law School; led the Conservation Law Foundation's Energy Project (Cohen, Armond. "Innovation Policy for Climate Change". September, 2009. http://www.cspo.org/projects/eisbu/report.pdf)

These observations lead to a third, perhaps unexpected point: There is no **necessary** reason **why DOE should be charged with responsibility for demonstrations of technologies to reduce CO2 emissions**. At the least, **policymakers might seek to create competition for DOE and its laboratories,** given that competition **in defense** has been such a powerful force **in** stimulating military innovation. **DoD, indeed, is one of the obvious candidates to help drive energy innovation, as it has done for years with jet engines/gas turbines**. Policymakers could also move to a new model for confronting climate change, treating GHG reduction as a public good, something like the provision of water supply and wastewater treatment services as matters of public health and welfare, a policy with enormous benefits for human health and longevity (the life expectancy of Americans at birth rose from 48 years in 1900 to 60 by 1930) **For years,** the Pentagon has been a major customer for energy **technologies and** energy **services**. The largest PV system operating in the United States supplies electricity to Nellis Air Force Base, Nevada**. DoD now spends over $1 billion annually on alternative energy** R&D, in addition to some $10 billion annually to fuel its ships, planes, ground vehicles, and generators, and another $4 billion for electrical power. 17 Twelve retired generals and admirals comprising the CNA Military Advisory Board recently concluded: "By addressing its own energy **security** needs, DoD can stimulate the market **for new energy technologies** .... [**T]he Department's historical role as technological innovator and incubator should be harnessed to benefit the nation as a whole**." 18 The jet engine has been a prime example. Once proven after World War II, jet engines moved from fighters to bombers, civilian airliners, and, in the form of gas turbines, to transports, helicopters, smaller naval vessels, and the Army's M-1 Abrams tank. By about 1980, efficiency, initially very low, had improved to the point that utilities began buying gas turbines to generate peaking power. Major contributions to continuous innovation came from military R&D and procurement and from the lessons of operational experience fed back to manufacturers by both the armed forces and commercial airlines.

2NC – Free Market – SMR Links

Financial incentives for SMRs kill innovation – smothers the free market

Spencer '11 (Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy, Studies at The Heritage Foundation, "Congress's Recent Attempts to Promote Small Modular Nuclear Reactors Fall Short", http://thf_media.s3.amazonaws.com/2011/pdf/wm3283.pdf, June 8, 2011,)

The House and Senate are considering bills that are meant **to** help **development** of small and modular nuclear reactors (**SMRs**). These new reactors could provide all of the attractive qualities of large reactors—such as being safe, emissions-free sources of electricity—but at lower upfront costs with greater flexibility. **Unfortunately, the two bills**—the Nuclear Energy Research Initiative Improvement Act of 2011 (S. 1067) and the Nuclear Power 2021 Act (S. 512 and H.R. 1808)—**would have the opposite impact**. **These bills would smother the private-sector initiative that has driven SMR development in recent years**. **Instead of embracing this new and innovative approach to nuclear energy development, these bills would subject the SMR business to the same government-depressed trajectory that plagues traditional reactors**. The Nuclear Energy Research Initiative Improvement Act (S. 1067). S. 1067 would authorize $250 million over five years to conduct research regarding SMR technology, power plant issues beyond nuclear technology, cost-efficient manufacturing and construction, licensing issues, and enhanced proliferation controls. **While the spirit** of the act **is laudable, its approach is mostly counterproductive**. The essence of the act is to mandate that the Department of Energy (DOE) develop a five-year plan to "lower effectively the costs of nuclear reactors." There are several problems with the act: • **More government support is not needed**. **Private investors have been driving the SMR business in recent years.** They recognized early on that small and modular rectors could potentially fulfill a market demand that large reactors could not fill, **and they have done it without government support.** • **The government is neither capable of reducing nor qualified to reduce the cost of nuclear reactors**. **Private industry has the interests, expertise, and background to develop cost-effective manufacturing and construction techniques. History demonstrates that government intervention would only slow the phenomenal progress made on the SMR front.** • **Government intervention has not produced a single new large reactor, and there is no reason to think it would work for SMRs. The** federal government's attempts to subsidize the commercialization of large reactors have failed to create a viable nuclear industry. **In contrast, the SMR business has by and large built privately funded commercial enterprises out of federal research and development projects.** Instead of controlling this innovation through DOE meddling, the federal government should embrace it as a model for other energy sectors. • The bill plays into the hands of the anti-nuclear lobby. The bill directs the DOE to conduct "public workshops" to generate "public comment" to inform its five-year plan. This opens the door to over-politicization and legal sandbagging—two of the anti-nuclear lobby's favorite progress-killing tactics. • Creating an arbitrary timeline makes no sense. **Government program timelines to produce commercial projects do not work**. **Once the government creates a development program, the market begins to revolve around it.** Then, as the timeline slips—as timelines always do—so does the eventual introduction of the products. **Timelines should be market- and investor-driven, not dictated by Congress** or the DOE. The Nuclear Power 2021 Act (S. 512 and H.R. 1808). The Nuclear Power 2021 Act creates a DOE program to develop two standard SMR designs and demonstrate the licensing process for those designs. In essence, it authorizes the DOE to dictate who will make up America's SMR business for the foreseeable future.

More warrants- picks winners and losers

Spencer '11 (Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy, Studies at The Heritage Foundation, "Congress's Recent Attempts to Promote Small

Modular Nuclear Reactors Fall Short", http://thf_media.s3.amazonaws.com/2011/pdf/wm3283.pdf, June 8, 2011,)

This is the wrong approach because: • It consolidates too much power in Washington. The legislation creates public–private partnerships to "develop" standard designs and "demonstrate" SMR licensing, but private companies already design SMRs. **There is no need for the federal government to intervene**. Moreover, the licensing process should occur between the design owner and the Nuclear Regulatory Commission (NRC). There is no role for the DOE. • **Lack of clarity risks socializing the SMR industry**. **The legislation uses taxpayer money to pay for up to 50 percent of SMR design development** and 25 percent of the licensing costs**. Critically, it does not stipulate who will own the part of the designs that taxpayers have funded.** So in essence, **the legislation creates a situation where the federal government designs reactors and has an ownership stake in them. • It is anti-competitive**. **Multiple companies have invested private dollars and resources to build the commercial SMR business**. **By choosing winners and losers, the DOE would take away the incentive to compete and replace it with the incentive to lobby Washington**. **The result would be that Washington, not the market, would decide which technologies move forward.**

2NC – Politics Shield

Status quo nuclear power unpopular with the military – Perception of lacking utility and safety concerns – the CP mechanism allays military concerns

Wong '12 (Kelvin Wong, Kelvin Wong is an Associate Research Fellow at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University. He is with the Military Studies Programme at the School's constituent unit, the Institute of Defence and Strategic Studies, "The Military's Quest for Nuclear Power", http://rolandsanjuan.blogspot.com/2012/05/beyond-weapons-militarys-quest-for.html, May 18, 2012

Military forces have also been stung by peacetime nuclear incidents. In March 2008, the American nuclear submarine USS Houston leaked minute amounts of radiation into Sasebo naval base while on a port call, triggering condemnation from Japanese citizens in the district. In the same year, the British nuclear submarine HMS Trafalgar leaked hundreds of litres of radioactive wastewater into a nearby river while docked at Devonport naval base, raising concerns from nuclear safety experts. Mainstream nuclear power in the military? Yet **military scientists have not ceased to be tempted by the potential of nuclear power**. In response to increasing oil prices and global supply uncertainties, and well-documented cases of logistical strain on forces operating in the Middle East in recent conflicts, the US Defense Advanced Research Projects Agency (DARPA) issued a proposal for innovative solutions in deployable compact nuclear reactors in 2010. In the proposal, **DARPA outlined the need to reduce the** logistical **burden of supplying** forward operating **bases** and forces **without access to reliable fuel supply lines**. The proposal also suggested that materials science have advanced to the stage where it might have a positive impact on deployable nuclear reactor research. While recent developments suggest that nuclear power technology can potentially be employed in unmanned aircraft and on the ground, it is **unlikely to have mainstream military utility**. The Cold War period was an era when general attitudes towards nuclear energy were quite favourable, and military experimentation was only limited by funding and scientific expertise. In contrast, nuclear power today has become a **hotly debated issue** despite its importance in powering the economies of advanced nations today. For the military, the problem with nuclear power is not just about cost and safety, but also of the nature of its operating environment. Deploying volatile nuclear reactors into harm's way on the battlefield, where their destruction and sabotage are likely, should give military planners cause to pause.

Military only shields the plan if they like it – proves they shield the CP but not the plan

Merchant 10 Political & Environment Columnist-Discovery, 10/21, "How the US Military Could Bring Solar Power to Mass Market," http://www.treehugger.com/corporate-responsibility/how-the-us-military-could-bring-solar-power-to-mass-market.html

Furthermore, Congress is **infinitely more likely** to approve funding for R&D; and infrastructure if the projects are military-related. Which is depressing, but true -- the one thing that **no politician can get caught opposing** is the safety of **American troops**. In fact, the whole premise of the article is rather depressing, on point though it may be: The only way we may end up getting a competitive clean energy industry is through serious **military investment**, which is of course, serious government spending. Which **under any other guise would be vehemently opposed by conservatives**.

DOD being the "first mover" solves the aff – avoids the link to politics

Madia 12 William, Chairman of the Board of Overseers and Vice President for the SLAC National Accelerator Laboratory at Stanford University, Spring, "Small Modular Reactors: A Potential Game-changing Technology", energyclub.stanford.edu/index.php/Journal/Small_Modular_Reactors_by_William_Madia

To determine if SMRs hold the potential for changing the game in carbon-free power generation, it is imperative that we **test the design**, engineering, licensing, and economic assumptions with some sort of public-private development and **demonstration program**. Instead of having government simply invest in research and development to "buy

down" the risks associated with SMRs, I propose a more novel approach. Since the federal government is a major power consumer, it **should commit to being the "first mover" of SMRs**. This means purchasing the first few hundred MWs of SMR generation capacity and dedicating it to federal use. The advantages of this approach are straightforward. The government would both reduce licensing and economic risks to the point where utilities might invest in subsequent units, thus **jumpstarting the SMR industry**. It would then also **be the recipient** of additional carbon-free energy generation capacity. This seems like a very sensible role for government to play **without getting into the heavy politics of nuclear waste, corporate welfare, or carbon taxes**.¶ If we want to deploy power generation technologies that can realize near-term impact on carbon emissions safely, reliably, economically, at scale, and at total costs that are manageable on the balance sheets of most utilities, we must consider SMRs as a key component of our national energy strategy.

2NC – Accidents – Links

Focus on industry trades off with safety

Gilinsky '8 (previous NRC commissioner, 8 (Victor, independent consultant--primarily on matters related to nuclear energy. He was a two-term commissioner of the US Nuclear Regulatory Commission from 1975-1984, and before that Head of the Rand Corporation Physical Sciences Department. He holds an Engineering Physics degree from Cornell University and a Ph.D. in Physics from the California Institute of Technology, which granted him its Distinguished Alumni Award. "Pro-industry priorities derail NRC's public-safety mission", Bulletin of the atomic scientists, 30 May, http://www.thebulletin.org/web-edition/roundtables/the-future-of-the-nuclear-regulatory-commission?order=asc#rt2324)

The Nuclear Rgulatory Commission's (**NRC) problems lie in the priorities at the top**. The overriding **priority--**evident from commission pronouncements and actions--**is to facilitate a major expansion**, or "renaissance," **of nuclear power**. That's okay elsewhere in the federal government, but not **at the NRC** because it **gets in the way of public safety and conducting fair proceedings.** This is especially evident in the licensing review of Nevada's Yucca Mountain, the site the Energy Department proposes as the country's high-level nuclear waste repository. The nuclear "renaissance" is said to depend on NRC approval of Yucca Mountain, and, thus far, the NRC has been accommodating. I'd like to provide a couple of examples based on my experience as a Nevada consultant--one example deals with safety and the other with fairness. The most disappointing aspect of NRC's role in Yucca Mountain is that it has agreed to toss overboard what has heretofore been the **sine qua non** of its safety philosophy--"defense-in-depth." Consequently, Yucca Mountain radiation standards are much more lax than repository standards in other countries. To explain the lack of defense-in-depth at Yucca Mountain requires some background. About 12 years ago, Energy discovered that supposedly dry Yucca Mountain had lots more water than estimated. It was moving a lot faster too, which meant the site wouldn't retain radioactive waste leakage. To keep the project alive despite this, Energy decided to put a near-total reliance on metal containers to retain the waste. Earlier, the NRC had warned against this approach when it approved Energy's geologic site criteria. But when push came to shove, the department kept the site and dropped the troublesome criteria and NRC went along. To keep corrosive water off the containers, Energy dreamed up the "drip shield"--a heavy titanium alloy cover that would run the length of each tunnel containing waste containers. But Energy doesn't plan to actually make or install the enormously expensive shields for 100 years or more, which makes installation a pretty doubtful proposition, even more so because it will be difficult to maintain a remotely operated underground transport system for that long. But without counting the drip shield, Yucca Mountain can't come close to passing federal radiation dose standards. And there's no backup. Naturally, Energy insists the NRC should assume the drip shield will be in place, however implausible that is. Sad to say, **the current NRC has been going along with this absurdity despite its 1998 white paper. That paper states: "The defense-in-depth philosophy ensures that safety will not be wholly dependent on any single element of the design, construction, maintenance, or operation of a nuclear facility**." The NRC website's current definition of defense-in-depth drops this language. All the while, it insists it's holding fast to design-in-depth.

2NC – Accidents – Turns Case

And if ONE reactor fails, we win

Ryan '11 - Glasgow Caledonian University Senior Fellow, Energy Department; Masters in Mechanical Engineering, expertise in energy, sustainability, Computer Aided Engineering, renewables technology; Ph.D. (Ryan, Dylan. "Part 10 – Small modular reactors and mass production options". 2011. http://daryanenergyblog.wordpress.com/ca/part-10-smallreactors-mass-prod/)

So there are a host of practical factors in favour smaller reactors. But what's the down side? Firstly, economies of scale. **With a small reactor, we have all the excess baggage that comes with each power station, all the fixed costs and a much smaller pay-off.** As I noted earlier, even though many smaller reactors are a lot safer than large LWR's (even **a small LWR is** somewhat **safer!)** you would still need to put them under a containment dome. It's this process of concrete pouring that is often a bottle neck in nuclear reactor construction. We could get around the problem by clustering reactors together, i.e putting 2 or 4 reactors not only on the same site but under the same containment dome. The one downside here is that **if one reactor has a problem, it will likely spread** to its neighbours. **How much of a showstopper this fact is depends on which type of reactors we are discussing**.

2NC – Accidents – AT: All SMRs Safe

No basis for optimism – empirically new technological promises fall short and move at a snails pace – you should prefer our specific link evidence over their tech optimism

Biello '12 - Associate Editor at Scientific American (David, March 27, "Small Reactors Make a Bid to Revive Nuclear Power", http://www.scientificamerican.com/article.cfm?id=small-reactors-bid-to-revive-nuclear-power)

But **multiple reactor sites proved problematic at Fukushima Daiichi, where an accident in one rapidly became a crisis for multiple reactors and spent fuel pools**. "If you're going to have multiple reactors, are you going to gain in safety or lose in safety?" asks physicist M.V. Ramana of Princeton University. "We don't know." "**Early in the discovery of any new technology you have this rosy picture that is formed**," **Candris admits of Small Modular Reactors.** "**In the early days of nuclear, there were people out there saying it would be too cheap to meter. We found out otherwise**."

Answers to

AT: Perm – Do Both

Still links – slow-rolling SMR adoption acclimates the military and public to the plan – does not distort the market with financial incentives, and innovates to solve accidents

AT: Perm – Do the CP

Severs Plural – CP builds one reactor – plan acquires more – the CP is plan minus
Meridith.edu No date ("Plural and Possessive," http://www.meredith.edu/grammar/plural.htm)
The plural form of a noun indicates simply that there are more than one of the person or thing in question. For most nouns, the plural form includes the letter "s" at the end of the word:

CX proves this…

Severs financial incentive – CP does not increase financial incentives – only constructs and operates a reactor

Severance is a voting issue competitive equity

Plan and CP are distinct – The Counter-Plan moves incrementally – the Plan is Fast-Forward - Sarewitz, Thernstrom and Hayward make a distinction between purchases for energy technology and testing energy tech to facilitate commercialization – It's predictable it's in the lit base – Ignoring the difference kills topic specific debates over mechanisms.

The CP is distinct – it gradually builds military support for energy technology – innovation creates confidence in new technologies within the DOD – Solves commercialization
Sarewitz and Thernstrom 12 (Daniel and Samuel - Consortium for Science, Policy, and Outcomes at Arizona State University, "ENERGY INNOVATION AT THE DEPARTMENT OF DEFENSE: ASSESSING THE OPPORTUNITIES,")
DARPA has repeatedly launched related technologies that complement each other and that help **build support** for the **commercialization or implementation** of one another. This concept of complementary technologies also ties to the notion of program thrusts. One way of thinking about this is that DARPA is not in the "thing" business—it is in the problem-solving business. While a specific innovation may have a major impact, it is unlikely that one such project by itself will adequately address a major challenge or problem. While DARPA may support an **individual invention**, it usually does so because that invention may be an element of an **overall solution to a challenge**. Confluence with an Advocate Community DARPA has spawned new economic sectors; these have in turns spawned new firms, which have garnered support from venture capital (VC). Accordingly, DARPA has been able to make its advances reinforce each other; it has been able to **play an intermediary role with industry in part by building an advocate community across sectoral lines**. A key element of DARPA's success in such areas as information technology, sensor systems, advanced materials, and directed **energy systems** is building the community of "**change agents**"—a broad community **fostered over time from** its program managers, from "graduates" of the DARPA program who go on to **roles in** academia and **industry**, and from contractors in universities and industry trained in the DARPA model and technology approaches. Connection to Larger Innovation Elements Going beyond the confluence with its support community, DARPA has been an actor within **larger innovation efforts**; it is often instrumental, but seldom a sole actor. This connection to larger innovation elements is important to DARPA's effectiveness because it does not have its own research facilities, and its program managers do not perform their own research. Thus, the DARPA PM's most important function is to identify and support those who have the potentially disruptive, change-state ideas and who will ably perform the necessary research. Thus, the PM is an opportunity creator and idea harvester within an emerging technology field. From this concept- or idea-scouting perspective DARPA has spawned a group of researchers, and from that, new firms that act to help effectuate the program's overall vision. However, this downward and outward linking into the research community and commercial industry is only one aspect of DARPA's connectivity to larger innovation elements. DARPA, as an agency of the Department of Defense, is part of a **broader innovation structure** within and for DoD. Crucial here is that DARPA is an independent organization under the secretary of defense and is explicitly separate from

the military service acquisition system. While the secretary of defense and the underlying Office of the Secretary of Defense (OSD) bureaucracy rarely directly involve themselves in DARPA's individual research programs, OSD leadership elements at various times have played a strong role in identifying the mission challenges they want DARPA to address. Thus, DARPA, working with OSD, has been able to **tie its advances to the larger innovation elements in DoD**, often **implementing its technologies through service procurement programs**.

AT: Picking Winners DA

Non-unique – SMR incentives now in the 1AC

Aff picks winners – no reason their mechanism links less than the CP

Picking Winners good in the context of the CP – key to DOD specifications – CP doesn't pick winners for commercialization

Andres and Breetz '11 (Richard B. Andres is professor of National Security Strategy at the National War College and a Senior Fellow and Energy and Environmental Security and Policy chair in the Center for Strategic Research, Institute for National Strategic Studies, at the National Defense University, Hanna L. Breetz is a doctoral candidate in the Department of Political Science at the Massachusetts Institute of Technology, "Small Nuclear Reactors for Military Installations: Capabilities, Costs, and Technological Implications", February 16, 2011,)

Technological Lock-in. A second risk is that if small reactors do reach the market without DOD assistance, the designs that succeed **may not be optimal for DOD's applications**. Due to a variety of positive feedback and increasing returns to adoption (including demonstration effects, technological interdependence, net- work and learning effects, and economies of scale), the designs that are initially developed can become "**locked in**."34 Competing designs—even if they are superior in some respects or better for certain market segments— can face barriers to entry that lock them out of the market. **If DOD wants to ensure that its preferred designs are not locked out, then it should take a first mover role on small reactors**. It is far too early to gauge whether the private market and DOD have aligned interests in reactor designs. On one hand, Matthew Bunn and Martin Malin argue that what the world needs is cheaper, safer, more secure, and more proliferation-resistant nuclear reactors; presumably, many of the same broad qualities would be favored by DOD.35 There are many varied market niches that could be filled by small reactors, because there are many different applications and settings in which they can be used, and it is quite possible that some of those niches will be compatible with DOD's interests.36 On the other hand, DOD may have **specific needs** (transportability, for instance) that would **not be a high priority for any other market segment**. Moreover, while **DOD has unique technical and organizational capabilities that could enable it to pursue more radically innovative reactor lines**, DOE has indicated that it will focus its initial small reactor deployment efforts on LWR designs.37 If DOD wants to ensure that its preferred reactors are developed and available in the future, it should take a leadership role now. **Taking a first mover role does not necessarily mean that DOD would be "picking a winner" among small reactors, as the market will probably pursue multiple types of small reactors**. Nevertheless, DOD leadership would likely have a profound effect on the industry's timeline and trajectory.

Politics Links

1NC- Unpopular

Aff gets spun as floating Chernobyl- unpopular

AP '6 (Associated Press, "Russian world-first: A floating nuclear plant", http://www.nbcnews.com/id/13316942/ns/world_news-world_environment/t/russian-world-first-floating-nuclear-plant/#.U3O1Kfk7uSo, June 14, 2006)

Environmental groups have sharply criticized the proposed floating reactors. "**Floating nuclear power plants are absolutely unsafe**, inherently so. There are risks of the unit itself sinking, there are risks in towing the units to where they need to be," **said** Charles **Digges**, editor of the Web site for the Norwegian-based environmental group Bellona. "They (Russians) are sitting on so much oil and have so many **other avenues to alternative** sources of **energy** for these particular regions where they would use floating nuclear power plants ... which **are cheaper** to build, cheaper to research," he said.

2NC- Unpopular

Plan is attacked by powerful lobbies- causes backlash

Szondy 12 (David, Gizmag, "Feature: Small modular nuclear reactors - the future of energy?," http://www.gizmag.com/small-modular-nuclear-reactors/20860/)

Indeed, it is in government regulations that the modular reactors face their greatest challenges. Whatever the facts about nuclear accidents from Windscale to Fukushima, a **large fraction** of the public, especially in the West, is **very nervous about nuclear energy** in any form. There are powerful lobbies opposed to any nuclear reactors operating and the regulations written up by governments reflect these circumstances. Much of the cost of building nuclear plants is due to meeting all regulations, providing safety and security systems, and just dealing with all the legal barriers and paperwork that can take years and millions of dollars to overcome. Modular reactors have the advantage of being built quickly and cheaply, which makes them less of a financial risk, and factory manufacturing means that a reactor intended for a plant that missed approval can be sold to another customer elsewhere. And some SMRs are similar enough to conventional reactors that they don't face the burden of being a "new" technology under skeptical scrutiny. However, **red tape is still a very real thing.**

And fear of accidents jack popularity

Bredimas and Nuttal 12 (Alexandre and William - Judge Business School, "A Comparison of International Regulatory Organizations and Licensing Procedures for New Nuclear Power Plants, ec.europa.eu/energy/nuclear/forum/opportunities/doc/legal_roadmap/2009_10_28/eprg-bredimas.pdf)

At the heart of the process, public acceptance is a **prerequisite** which is most important during the siting step. If one accepts a site for a new nuclear plant, one must also accept wider national or regional need for a new nuclear plant. Western public anxiety towards nuclear power emerged strongly after the **accidents** of Three-Mile Island, PA, USA in 1979 and Chernobyl, Ukraine in 1986. Arguably, in addition, the modern public fundamentally mistrusts political elites and large companies. In the case of nuclear power **mistrust** can run even deeper because of an historical association between nuclear innovation and the military. The military legacies of nuclear power result in a widespread perception, and arguably a reality, of top-down nuclear strategy surrounded by a climate of secrecy. Publics and other stakeholders are therefore likely to be **highly sensitised** to the democratic features of siting policy and are likely to give great emphasis to safety issues during the licensing process of any new nuclear plant.

SMRs do not circumvent backlash

Taso '11 (Firas Eugen Taso, "21st Century Civilian Nuclear Power and the Role of Small Modular Reactors", Fletcher School of Law and Diplomacy; Tufts University, May 2011 http://search.proquest.com.ezproxy1.lib.asu.edu/docview/877618836, 8-2-12)

Paolo Ferroni also mentions that **SMRs would not solve the public concern over nuclear power. To the general public, they would still be nuclear facilities, something that they do not understand and fear.** Unless they were proven and demonstrated, **opposition would exist even for the smaller demonstration projects. The NIMBY attitude would likely preclude SMRs from being a game changer for nuclear power, unless something changes dramatically,** not only incrementally, **in public perception.**

2NC- DOE $ Unpopular

Nuclear power R&D unpopular- spending

Yurman ’12 (Dan Yurman, The Energy Collective Thinktank, Marketing Communications Services for Energy Technologies, Member of the Advisory Board, the Energy Collective, a project of Social Media Today, Launched the official blog of the American Nuclear Society (ANS), In June 2011 I received a special recognition award from the American Nuclear Society for work on communication of nuclear energy science and engineering information to the news media and the public during the Fukushima crisis in Japan, “SMR developers are racing to the market”, http://theenergycollective.com/node/77332, February 22, 2012)

DOE's 2013 budget flatlines support for new nuclear tech Its' a dark time for expectations of new funding for nuclear reactor technology. The **Obama** administration's **budget request to Congress for DOE's nuclear energy programs for fiscal year 2013 reflects it.** Here are a few highlights of the Obama administration's financial plans for nuclear energy R&D. The 2012 figure is the amount appropriated by Congress for the current fiscal year that ends next October and the 2013 figure is the amount requested by the President. **SMR licensing support is cut by $2 million** from $67 million in 2012 to $65 million in 2013. **Advanced reactor R&D and development is slashed by $41 million** from $115 million in 2012 to $74 million in 2013. **Fuel cycle R&D is nicked $9 million** down from $186 million in 2012 to $175 million in 2013. Of this amount $60 million is allocated to implement recommendations of the Blue Ribbon Commission. **So what does it mean for SMRs**? **In a word, not much has changed from 2012**. **It will be an uphill battle for SMR developers of all types**. A presidential budget request is just that - a request. It is not a decision. It is a presidential election year with the entire House and one-third of the Senate up for a vote. Also, many incumbents are mindful of the fact that public approval ratings for congress in general are in the single digits making a "throw the bums out" spirit stronger than usual. The **turmoil surrounding decisions about federal funding will be more intense than usual and that means nothing should be taken for granted - especially the numbers in the President's budget. Competition for nuclear R&D dollars is way down the priority list for a deficit minded Congress that yet seeks to prove to voters they matter for something.**

AT: Floating Different

Floating nuclear magnifies nuclear concerns- doesn't solve them

Wellock '13 (Thomas Wellock, NRC Historian, "Waves of Uncertainty: The Demise of the Floating Reactor Concept (Part II)", http://public-blog.nrc-gateway.gov/2013/09/26/waves-of-uncertainty-the-demise-of-the-floating-reactor-concept-part-ii/, September 26, 2013)

Offshore Power Systems, apparently, did not appreciate that putting land-based reactors out to sea was bound to raise new safety, environmental and regulatory questions. **Concerns about** ship **collisions**, off-shore **fishing** grounds, **barge sinking and** the challenge of **creating a new regulatory process for floating reactors were** just some of the **unique issues** facing regulators. Even the trade press raised concerns. **Nuclear News worried about the "incredibly tangled mass of overlapping jurisdictions, state, national, and international law, inter-agency authority"** that included new players such as the U.S. Coast Guard. Drawing from a 1978 GAO report. Drawing from a 1978 GAO report. Events conspired to worsen OPS's prospects. The oil crisis that began in 1973 made construction financing expensive and slowed electricity consumption. Facing slack demand, PSEG postponed delivery of the first floating plant from 1981 to 1985 and later to 1988. Tenneco backed out of the OPS partnership in 1975. With the entire enterprise threatened, Westinghouse and the Florida Congressional delegation asked the federal government to purchase four plants. But, the prospect of "bailing out" OPS did not appeal to officials in the Ford Administration. The purchase proposal died. **Floating reactors did not solve regulatory or political problems**. **The production** facility in Jacksonville **needed an NRC** manufacturing **license. There were so many technical and regulatory uncertainties that the licensing review ran three years behind schedule**. A 1978 report from the U.S. General Accounting Office criticized the NRC for what it believed was an incomplete safety review, particularly for not accounting for impacts on the ocean ecosystem during an accident where a melting reactor core broke through the bottom of the barge. **Local and state opposition to the plant was intense**. Nearby counties voted in non-binding referendums 2 to 1 against the Atlantic Generating Station, and the New Jersey legislature refused to introduce a bill to turn the offshore site over to PSEG. Westinghouse held out hope for a brighter future; PSEG didn't. In late 1978, the utility announced it canceled its orders for all four of its floating plants. Slack demand, it noted, was "the only reason" for the cancellations. "We simply will not need these units" in the foreseeable future, a utility official admitted. **Others blamed excessive regulation**. In March 1979, John **O'Leary**, a Department of Energy deputy secretary, **provided** to the White House **a "grim—even alarming report**," as one staffer said, that **the NRC delays with the OPS license were symptomatic of a larger problem**. "**It has become impossible to build energy plants in America**" O'Leary said, **due to excessive environmental regulations and an indecisive bureaucracy.** Environmental **laws**, O'Leary complained, had created **"a chain of hurdles which effectively kill energy projects**" and damage to the nation's economy. He wanted presidential action. Drawing from a 1978 GAO report. Drawing from a 1978 GAO report. Events rendered O'Leary's plea for action moot. Two and a half weeks later the Three Mile Island accident occurred, ending any hope of an imminent industry rebound. The accident raised anew questions about a core melt accident and further delayed the manufacturing license. The NRC did not issue a license until 1982. In 1984, Westinghouse formally abandoned the OPS enterprise, dismantled the Jacksonville facility, and sold its huge crane to China. **Going to sea**, OPS discovered, **did not allow it to escape the problems that beset nuclear power**. A novel technological solution could not overcome public distrust and economic, technical and regulatory uncertainty. We shall see how Russia handles the challenges.

AT: Nuclear Lobby Powerful

The nuclear lobby has no influence – only a risk of a turn

Hopf '12 (Jim, senior nuclear engineer, 20 years of experience in shielding and criticality analysis, regular contributor to ANS nuclear café ["The Party Platforms on Energy – And Nuclear," September 18th, http://ansnuclearcafe.org/2012/09/18/the-party-platforms-on-energy-and-nuclear/, September 18, 2012)

My general view is that the Republicans primarily support fossil fuels while the Democrats primarily support renewables. Both are now supporting gas, to some degree. **Neither party supports nuclear to any significant degree.** T**his is due to a profound lack of influence in Washington by the nuclear industry, compared to other energy industries**. Recently, **some have tried to suggest that the industry** (Exelon Corp., specifically) **has had significant influence with Obama, due to campaign contributions** and its presence in Illinois. **This view is absurd**. Here's a question: What is **the ONLY major energy source that was NOT mentioned at all in Obama's** Democratic convention **speech**? He (the Democratic candidate) even made brief mention of "clean coal", but didn't mention **nuclear** at all. **Due** in large part **to this lack of influence, the current regulatory playing field is heavily slanted against nuclear**, with nuclear's requirements being orders of magnitude more strict than those applied to fossil fuels (as measured by dollars spent per unit of public health and safety benefit, etc.). Five years ago, it seemed like things were finally moving in a more fair, balanced direction, with the prospect of CO2 limits, etc., but now things seem set to get even worse. We have the NRC considering adding even more regulation, and arguing that current regulations are insufficient since the Fukushima event inflicted significant economic costs, even though the public health impacts have been very small—much smaller than what NRC had always assumed the consequences of a severe meltdown would be (i.e, current regulations were always based on the assumption that such an event would be vastly more harmful). Meanwhile, we hear calls from the right side of the political spectrum, to reign in or even eliminate the EPA, with no similar calls for the NRC. Humble proposals to merely reduce the ~20,000 annual deaths, in the United States alone, from fossil plant pollution are loudly decried, while nuclear requirements are being increased even further, in a quest to reduce even the chance of the release of pollution to even more negligible levels, without any fanfare or political resistance (even from the industry itself). **Nuclear's complete lack of political influence, and the overly powerful influence of other sources such as coal, is starting to be examined** in some quarters—a recent article by William Tucker being one example.

Proliferation DA

1NC

SMRs could meltdown on the sea, also risk of piracy, theft and proliferation in transport

Marishak ’10 (Martin Matishak, Global Security Newswire, International Policy Thinktank, “Floating Nuclear Reactors Could Fall Prey to Terrorists, Experts Say”, http://www.nti.org/gsn/article/floating-nuclear-reactors-could-fall-prey-to-terrorists-experts-say/, August 13, 2010)

Russia is wrapping up work on the first of a proposed fleet of floating nuclear reactors that would provide electricity to remote areas, but that are also more vulnerable to terrorists and even piracy than traditional power stations, experts say (see GSN, Oct. 1, 2007). **Sailing small, modular atomic reactors raises concerns about proliferation**, along with their **safety in extreme weather conditions** and what to do with the radioactive waste they produce. "The sort of emotional reaction is, well, if you didn't like nuclear power reactors to begin with will you like them any better if they're floating?" Sharon Squassoni, director of the Center for Strategic and International Studies' Proliferation and Prevention Program, said in a recent telephone interview. "Probably not. Whatever problems you have on land, you can equally have on sea only **if you have a core meltdown in the water you're going to have a huge radioactive problem on hand**." Russia's nuclear agency launched the Academician Lomonosov, a barge that would eventually carry a power plant, on June 30 in St. Petersburg. The $200 million vessel, which measures roughly 472 feet long and 98 feet wide, would accommodate two 35-megawatt reactors, known as KTL-40Cs, and could provide electricity for up to 200,000 people, Rosatom officials say. The average land-based nuclear power reactor generates about 1,000 megawatts of electricity, Squassoni said. The reactor itself would be ready to operate in late 2012, the first of seven vessels Russia intends to build within five years. At least 15 countries -- including Algeria, Argentina, China and Malaysia -- have shown interest in contracting the services of such a system, according to the nuclear agency. The first ship would help power Vilyuchinsk, a city on Russia's Kamchatka Peninsula that serves as an atomic submarine base. Similar models could deliver electricity to the country's hard-to-reach northern territories, where harsh weather makes regular coal and oil deliveries unreliable and expensive. The reactor could also be modified into a desalination plant in order to produce fresh water. Nuclear fuel for the plant would be loaded in the northern Murmansk region, and the station towed to its place of operation. The plant would store waste and spent fuel in an onboard facility that workers would empty every 10 to 12 years during regular maintenance overhauls. The reactor and the spent fuel would then go to a storage facility in Russia, but the barge could be recycled. The ships would need to be refueled once every three years. The vessel would be hauled away after 32 years of service. The station's offshore locale is a key potential benefit as the power plant would be kept away from population areas where residents might otherwise object to the presence of nuclear energy operations, according to Mark Hibbs, a senior associate in the nuclear policy program at the Carnegie Endowment for International Peace. Other advantages include lower upfront investment costs for the smaller, modular reactors and the system's overall ability to be towed near remote settlements where need for electricity is greatest, he said in a recent telephone interview. Hibbs added that Indonesia, and far-flung parts of its archipelago, could be the technology's biggest potential customer. The technology could also prove particularly beneficial to mining companies to power operations to extract oil and gas and other valuable minerals from the Arctic shore and other remote regions, he told Global Security Newswire. Proliferation and Environment Concerns The exact level of enrichment of the uranium fuel for the floating reactor is unclear, according to Vladimir Chuprov, head of Greenpeace Russia's energy department. Russian officials initially said the plant would use uranium that had been enriched to between 40 and 60 percent, well above the 3 to 5 percent needed to be considered commercially viable. Uranium refined higher than 20 percent is considered to be highly enriched, while weapon-grade uranium usually requires enrichment levels exceeding 80 or 90 percent. Still, **less sophisticated nuclear devices could be manufactured with sufficient quantities of non-weapon-grade material**, Chuprov said. The reactor's fuel enrichment figure recently settled around 18 percent, too close for comfort to the 20 percent threshold where the material becomes offensively viable, according to Chuprov. "To enrich uranium is a very consuming technology. You need a lot of centrifuges, power and time to get to military-grade uranium but to enrich to 5 or 8 percent would mean that you made it 60 percent down the road towards" that goal, he told GSN in a recent telephone interview from Moscow. "If you have 18 percent, to get to military-grade is nothing." That material**, even if it is low-enriched uranium, is a serious proliferation concern "because it could be diverted before it's ever started up in the reactor,**" according to Edwin Lyman, a senior staff scientist at the Union of Concerned Scientists. He noted the **reactors must be stripped down to fit aboard the barge and therefore don't have the kind of robust containment structures and auxiliary safety systems larger, land-based nuclear power plants possess**. One way to stem such concerns might be to expand the International Atomic Energy Agency'sConvention on Nuclear Safety to include sea-based platforms, Lyman said in a telephone interview last month. Today, that pact commits participating states that operate land-based nuclear power plants with high safety levels. There are also worries on the global level that **some host nations**, specifically those in conflict zones, **might not have the resources to ensure the facilities' security**, according to a review by the Nuclear Threat Initiative. The areas where the barges would be deployed, including the Philippines, could expose them to the threat of piracy, according to Hibbs. "The consequences of an **act of piracy** involving a facility like this **would be devastating** because essentially you would be facing a situation where **you have a mobile radiological weapon**," he said. **Pirates could then**

use the reactor as blackmail and engineer an accident anywhere in the world, he added. There are also liability concerns that must be addressed, Squassoni said, such as which country -- Russia or the reactor barge's host nation -- would be responsible for training personnel and creating the safety culture. "It gets to be a little messy and I'm not quite sure anyone has worked out the whole tangled web that happens when you simply station these reactors offshore," Squassoni said. Experts are quick to recall Soviet-era nuclear accidents, such as Chernobyl, and Russia's naval disasters. The former communist state operated a fleet of nuclear-powered submarines as well as icebreaker vessels. Chuprov argued that the risk of a nuclear accident on a floating nuclear power plant is greatly increased because it is even more susceptible to the elements, adding that some of the countries supposedly interested in the technology have fallen victim to tsunamis in the past. Russia's "**history of nuclear accidents shows that sometimes they even have a core meltdown**, which is the most dangerous situation with a reactor," he said. "Think of if they have to sink a reactor in high seas." Questions submitted to Rosatom last month were not answered by deadline. Broader Proliferation Worries While the floating reactors are something of a "sexy" and "eye-catching" approach to alternative energy, they only constitute part of the potential threat of the expansion of nuclear power, according to Squassoni. Nations such as Pakistan are looking to expand their atomic energy capabilities while a number of states in the Middle East are trying to build programs from the ground up. Some suppliers, including India and South Korea, do not always adhere to international export guidelines, she said. Meanwhile, the United States does not have a sufficiently strong relationship with exporters such as China to influence their behavior. Pakistan and China have worked together on nuclear technology in the past and U.S. intelligence officials believe Islamabad's warheads were designed based from China's own nuclear arms. The United States recently indicated it intends to oppose a planned Chinese atomic reactor sale to Pakistan (see GSN, July 23). Squassoni also noted that South Korea, China and Canada have begun promoting "exotic little" reactor designs for energy use that might lead to production of more weapon-usable uranium fuel and spent nuclear material around the globe. "The whole group of countries that are looking at nuclear power reactors for the first time, do you want all them to go to India and China and even South Korea?" Squassoni said. The International Atomic Energy Agency has estimated that global demand for small reactors could reach 500 to 1,000 units by 2040, according to Lyman. "Nuclear power isn't a child's toy that if you can just build it small enough and cheaply enough you can deploy it anywhere and people push a button to have power," he said, describing the idea of floating nuclear power plants "a technology in search of a client." A spokesman for **the U.S. N**uclear **R**egulatory **C**ommission, which reviews applications to certify small modular reactor designs, said **all of the proposals currently being considered involve land-based facilities**. A spokesman for the Nuclear Energy Institute, a policy organization of the nuclear energy and technologies industry, said he was unaware of any U.S. companies with such commercial designs. Lyman and Squassoni proposed the Nuclear Suppliers Group might be the appropriate forum to address the proliferation risks of small reactors, as opposed to the U.N. nuclear watchdog which promotes peaceful nuclear energy use. The 46-nation group can seek to limit the sale of member nations' nuclear technology and materials to states that have signed the Nuclear Nonproliferation Treaty.

Terrorist attacks ensure meltdown- extinction

Wasserman '1 (Harvey, Senior Editor – Free Press, "America's Terrorist Nuclear Threat to Itself", October, http://www.wagingpeace.org/articles/2001/10/00_wasserman_nuclear-threat.htm)

The assault would not require a large jet. The safety systems are extremely complex and virtually indefensible. One or more could be wiped out with a wide range of easily deployed small aircraft, ground-based weapons, truck bombs or even chemical/biological assaults aimed at the operating work force. Dozens of US reactors have repeatedly failed even modest security tests over the years. **Even heightened wartime standards cannot guarantee protection of the vast, supremely sensitive controls required for reactor safety**. **Without continous monitoring and guaranteed water flow, the thousands of tons of radioactive rods in the cores and the thousands more stored in those fragile pools would rapidly melt into super-hot radioactive balls of lava that would burn into the ground and the water table** and, ultimately, the Hudson. Indeed, a jetcrash like the one on 9/11 or other forms of terrorist assault at Indian Point could yield three infernal fireballs of molten radioactive lava burning through the earth and into the aquifer and the river. **Striking water they would blast gigantic billows of horribly radioactive steam into the atmosphere. Prevailing winds from the north and west might initially drive these clouds of mass death** downriver into New York City and east into Westchester and Long Island. But at Three Mile Island and Chernobyl, **winds ultimately shifted around the compass to irradiate all surrounding areas with the devastating poisons released by the on-going fiery torrent.** At Indian Point, thousands of square miles would have been saturated with the most lethal clouds ever created or imagined, depositing relentless genetic poisons that would kill forever. In nearby communities like Buchanan, Nyack, Monsey and scores more, **infants and small children would quickly die en masse**. Virtually all **pregnant women would spontaneously abort, or ultimately give birth to horribly deformed offspring**. Ghastly sores, rashes, ulcerations and burns would afflict the skin of millions. Emphysema, heart attacks, stroke, multiple organ failure, hair loss, nausea, inability to eat or drink or swallow, diarrhea and incontinance, sterility and impotence, asthma, blindness, and more would kill thousands on the spot, and doom hundreds of thousands if not millions. A terrible metallic taste would afflict virtually everyone downwind in New York, New Jersey and New England, a ghoulish curse similar to that endured by the fliers who dropped the atomic bombs on Hiroshima and Nagaskai, by those living downwind from nuclear bomb tests in the south seas and Nevada, and by victims caught in the downdrafts from Three Mile Island and Chernobyl. **Then comes** the abominable wave of **cancers, leukemias, lymphomas, tumors and hellish diseases** for which new names will have to be invented, and new dimensions of

agony will beg description. Indeed, **those who survived the initial wave of radiation would envy those who did not**. **Evacuation would be impossible, but thousands would die trying**. Bridges and highways would become killing fields for those attempting to escape to destinations that would soon enough become equally deadly as the winds shifted. **Attempts to quench the fires would be futile**. At Chernobyl, pilots flying helicopters that dropped boron on the fiery core died in droves. At Indian Point, such missions would be a sure ticket to death. Their utility would be doubtful as the molten cores rage uncontrolled for days, weeks and years, spewing ever more devastation into the eco-sphere. More than 800,000 Soviet draftees were forced through Chernobyl's seething remains in a futile attempt to clean it up. They are dying in droves. Who would now volunteer for such an American task force? The radioactive cloud from Chernobyl blanketed the vast Ukraine and Belarus landscape, then carried over Europe and into the jetstream, surging through the west coast of the United States within ten days, carrying across our northern tier, circling the globe, then coming back again. The radioactive clouds from Indian Point would enshroud New York, New Jersey, New England, and carry deep into the Atlantic and up into Canada and across to Europe and around the globe again and again. **The immediate damage would render thousands of the world's most populous and expensive square miles permanently uninhabitable**. **All five boroughs of New York City would be an apocalyptic wastela**nd. The World Trade Center would be rendered as unusable and even more lethal by a jet crash at Indian Point than it was by the direct hits of 9/11. All real estate and economic value would be poisonously radioactive throughout the entire region. Irreplaceable trillions in human capital would be forever lost. As at Three Mile Island, where thousands of farm and wild animals died in heaps, and as at Chernobyl, where **soil, water and plant life** have been hopelessly irradiated, natural eco-systems **on which human and all other life depends would be permanently and irrevocably destroyed**, Spiritually, psychologically, financially, ecologically, our nation would never recover. This is what we missed by a mere forty miles near New York City on September 11. Now that we are at war, this is what could be happening as you read this. **There are 103 of these potential Bombs of the Apocalypse now operating in the U**nited **S**tates. They generate just 18% of America's electricity, just 8% of our total energy. As with reactors elsewhere, the two at Indian Point have both been off-line for long periods of time with no appreciable impact on life in New York. Already an extremely expensive source of electricity, the cost of attempting to defend these reactors will put nuclear energy even further off the competitive scale. Since its deregulation crisis, California---already the nation's second-most efficient state---cut further into its electric consumption by some 15%. Within a year the US could cheaply replace virtually with increased efficiency all the reactors now so much more expensive to operate and protect. Yet, as the bombs fall and the terror escalates, Congress is fast-tracking a form of legal immunity to protect the operators of reactors like Indian Point from liability in case of a meltdown or terrorist attack. Why is our nation handing its proclaimed enemies the weapons of our own mass destruction, and then shielding from liability the companies that insist on continuing to operate them? Do we take this war seriously? Are we committed to the survival of our nation? If so, **the ticking reactor bombs that could obliterate the very core of our life and of all future generations must be shut down**.

Proliferation leads to a global nuclear war.

Taylor 6 [Theodore B., Chairman of NOVA. July 6 2006, "Proliferation of Nuclear Weapons," http://wwwee.stanford.edu/~hellman/Breakthrough/book/chapters/taylor.html]

Nuclear proliferation - be it among nations or terrorists - greatly increases the chance of nuclear violence on a scale that would be intolerable. Proliferation **increases the chance that nuclear weapons will fall into the hands of irrational people, either suicidal or with no concern for the fate of the world. Irrational or outright psychotic leaders of military factions or terrorist groups might decide to use a few nuclear weapons under their control to stimulate a global nuclear war**, as an act of vengeance against humanity as a whole. Countless scenarios of this type can be constructed. Limited nuclear wars between countries with small numbers of nuclear weapons could escalate into major nuclear wars between superpowers. For example, **a nation** in an advanced stage of "latent proliferation," finding itself **losing a** nonnuclear **war, might complete the transition to deliverable nuclear weapons and, in desperation, use them. If that should happen in a region, such as the Middle East, where major superpower interests are at stake, the small nuclear war could easily escalate into a global nuclear war.**

2NC Link

Nuclear power plants on water ensure unchecked proliferation to rogue terrorist

Fesko '2 (Eduard Fesko, James Martin Center for Nonproliferation Studies, "Russian Floating Nuclear Reactors - Proliferation Risks", http://cns.miis.edu/stories/020624.htm, June 24, 2002)

For the past 10 years, high-ranking officials from Russia's Ministry of Atomic Energy (Minatom) and Rosenergoatom have been expressing unequivocal support for construction of floating nuclear power plants in remote areas of the Russian Far North and East. Construction of Russia's first floating nuclear power plants is moving ahead. These small power plants would provide electricity and heat to regions with underdeveloped infrastructure or to the sites of big construction projects. **The mobile nature of floating nuclear power plants** would purportedly allow them to be moved to areas struck by natural disasters or other emergencies. The plants could also be used for desalination of sea water. In addition, Russian government officials believe that floating nuclear power plants possess significant export potential. However, since these plants will be powered by reactors running on highly enriched uranium (HEU, in which the share of the uranium-235 isotope is over 20%), exports of such plants **increase the global proliferation of this especially sensitive nuclear material**. HEU is more readily converted to weapon-grade material than low enriched fuels. Physical protection of exported plants and issues of ownership and liability are also difficult problems. Background From 1991 to 1994, Malaya Energetika, a publicly traded company created under the auspices of Minatom, conducted a competition to determine the best design for a small capacity nuclear power plant. The winning project called for construction of a floating nuclear power plant with two KLT-40C pressurized water reactors, the type used in Russian Arktika- and Taymyr-class nuclear icebreakers. These reactors run on HEU. The project was developed by the joint stock company Atomenergo, which was created in 1993 by the Afrikantov Experimental Machine Building Design Bureau (OKBM) (Nizhniy Novgorod), the Nizhniy Novgorod Machine Building Plant, the Iceberg Central Design Bureau (St. Petersburg), the Baltic Shipyard (St. Petersburg), and Atomflot (Murmansk).[1] The floating nuclear power plants would be accommodated aboard barges (with dimensions of 140 meters (m) by 30 m by 10 m and a water displacement of 20,000 metric tons) that would be towed to their destination and anchored off shore. Each plant's two turbo generators, powered by the two KLT-40C nuclear reactors, would produce 60 megawatts (MW) of electricity. Spent nuclear fuel would be stored aboard, and the vessel would also have all the necessary equipment for refueling the reactors during the 12-year periods between plant overhauls. A staff of 60 would service the plant. The service life of the plant would be 40 years and during this period the plant would undergo two major overhauls at a shipyard.[2] Costs Though government officials at both the federal and the local level hail the economic efficiency of floating nuclear power plants, it is unclear how much their operation or construction will cost. In the January 29, 2002 issue of Izvestiya, Grigoriy Vengerovich, technical director of the floating nuclear power plant construction project at Sevmash (Arkhangelskaya Oblast), was quoted as saying that it will cost three billion rubles (over $98 million as of January 29, 2002) to build such a power plant in Severodvinsk.[3] Construction costs for a similar power plant for Vilyuchinsk (Kamchatskaya Oblast) are estimated at $203.5 million.[4] In 2000, a group of Russian environmental and nuclear experts estimated that construction of a floating nuclear power plant for Pevek (Chukotskiy Autonomous Okrug) would cost $279.4 million,[5] while Minatom's figures for the same project were over $300 million.[6] Construction costs in the Far East (Vilyuchinsk and Pevek) may be higher than in the European part of Russia due to higher transportation costs, but transportation costs alone do not explain the cost discrepancies. The same ambiguity also surrounds the price of electricity production. Vengerovich maintains that a kilowatt will cost no more than 36 kopecks (a little over one cent).[7] In October 2001, however, Kamchatskaya Oblast Governor Mikhail Mashkovtsev said that a kilowatt produced by a floating nuclear power plant will cost just over one ruble (four cents as of October 29, 2001).[8] According to Greenpeace-Russia representative Ivan Blokov, Minatom expects to produce electricity at the cost of 10-12 cents per kilowatt.[9] It is unknown what factors Russian officials take into account when calculating the projected price of the electricity. It is unclear whether the cost of transportation of nuclear fuel, handling of radioactive waste, provision of plant security, development and maintenance of infrastructure, environmental protection and rehabilitation, etc., are included in the calculations or whether the real price is in fact much higher. Current Plans During an international seminar entitled "Small Power Plants: Results and Prospects," held in Moscow on October 10, 2001, Minatom announced that 33 towns and villages in the Russian Far North would receive small nuclear power plants. Eleven of these power plants would be floating and are supposed to be constructed for Severodvinsk, Vilyuchinsk, Pevek (Chukotskiy Autonomous Okrug), Sovetskaya Gavan (Khabarovskiy Kray), Nakhodka (Primorskiy Kray), Rudnaya Pristan (Primorskiy Kray), Nikolayevsk-na-Amure (Khabarovskiy Kray), Olga (Primorskiy Kray), Dudinka (Taymyrskiy Autonomous Okrug), Onega (Arkhangelsk Oblast), and the construction site of the Trukhanskaya hydroelectric plant (Evenkiyskiy Autonomous Okrug).[10] The announcement at the seminar indicated that installation of the first floating nuclear power plant in Russia would begin in 2005 in Kamchatka. The technical design of the power plant -- a barge with two KLT-40C reactors with a total output of 70MW -- has been completed and awaits a construction license. According to the announcement, installation of the second floating nuclear power plant is scheduled to begin in 2006 in Severodvinsk.[11] After attending a government meeting on 18 December 2001, Arkhangelsk Oblast Governor Anatoliy Yefremov announced that in 2002 Minatom would spend 130 million rubles (almost $4.3 million on that date) to assess the technical and economic feasibility of building floating nuclear power stations in Severodvinsk.[12] It is unclear which plant will be built first. Local authorities are usually very enthusiastic about having a floating nuclear power plant since financing for its construction will come from Moscow, which means that the local economy will get a new power generating plant at no cost. Proliferation Concerns Minatom's intention to export floating nuclear power plants (NPPs) adds to other concerns about these plants. Among possible buyers, Russian government officials identify China,[13] Indonesia, and the Philippines.[14] Under the nuclear Non-Proliferation Treaty (NPT), Russia is allowed to export such plants as long as it exports the plants and their fuel to countries that are signatories of the NPT and accept full-scope safeguards (monitoring activities that apply to all fissile material in a non-nuclear weapon state to ensure that those fissile materials are not used for military purposes) of the International Atomic Energy Agency. Thus, Russia cannot export its floating nuclear power plants to such countries as Cuba, India, Israel or Pakistan. But **exporting HEU-fueled reactors undermines efforts to reduce global stockpiles of HEU and consolidate them in as few and secure places as possible.** The exact level of enrichment of the uranium fuel for the floating reactor is unclear. While Russia has alternate designs that would allow it to build a floating reactor powered by low-enriched uranium (uranium, in which the share of the uranium-235 isotope is under 20%, usually around 2-4%), this would entail a costly redesign of the KLT reactor. Instead, current plans call for HEU-powered reactors, which may use uranium enriched up to 90% (weapons-grade).[15] OKBM scientists will not reveal the level of of uranium enrichment for the floating reactor, but they indicated that it would be well above 20%.[16] **HEU exports**, especially to such politically unstable countries as Indonesia or the Philippines, **would constitute a serious proliferation risk: nuclear material might be stolen or the floating nuclear power station could become the object of a terrorist attack**. In either case, the floating reactor itself and the nuclear fuel must be properly guarded to ensure that the HEU does not fall into the wrong hands. It is unclear, however, whether it is Russia or the importer that will have to provide security for the floating NPP. In

1997, Deputy Minister of Atomic Energy Yevgeniy Reshetnikov said "Russia will design [the floating nuclear power plant], build it, operate it, and take it away."[17] He did not mention who will be responsible for protection of the plant once it is delivered to the customer. Russian officials say that exported floating nuclear power plants will comply with all security standards applied to land-based nuclear power plants in Russia.[18] Will Russia itself send its military to guard the plant? Or will the receiving side provide guards who will follow Russian regulations? If Russian military personnel are sent along with the plant, a host of questions must be resolved -- what status will Russian soldiers have in a foreign country, what rules of engagement would apply, who will have the ultimate jurisdiction over the plant and its staff, etc.? If the importing country is to guarantee security, what happens if there is a regime change in that country and the new government does not want to honor the previous government's obligations? Environmental Concerns Numerous environmental activists agree that floating nuclear power plants pose many risks to the environment and public health. They question the utility and safety of civilian electricity production through the use of a nuclear reactor designed for naval propulsion. Since there are technical limitations to implementing many of the safety features of a land-based NPP on a floating NPP (for example, their reactors cannot be hidden underground or behind high-impact concrete walls as is the case with land-based NPPs), **they argue that the risk of a nuclear accident on a floating nuclear power plant is increased.** The physical security of such a plant is also a big concern: how well would it be protected against a missile, torpedo or terrorist attack, falling plane, earthquake, tsunami, temperature changes and harsh weather conditions? The plants' potential impact on the fragile Arctic environment through emissions of radioactivity and heat is not clear and remains a major concern. Although a floating nuclear power plant is supposed to be completely autonomous and provide storage for spent nuclear fuel and radioactive waste aboard, environmentalists fear that if additional radioactive waste is produced and there is no room for it aboard the vessel, that extra waste will be dumped into the sea or on shore nearby.[19] **Given these points, the use of HEU and the inherent vulnerability of floating NPPs to outside attack**, Minatom's **plans to export floating nuclear reactors raises serious questions**, especially given recent security lapses at nuclear power plants inside Russia.

2NC Impacts

Nuclear proliferation causes extinction

Krieger 09

[David Krieger, President of the Nuclear Age Foundation and a Councilor on the World Future Council, "Still Loving the Bomb After All These Years", Nuclear Age Peace Foundation, 9-4-2009, http://www.wagingpeace.org/articles/2009/09/04_krieger_newsweek_response.php]

Jonathan Tepperman's article in the September 7, 2009 issue of Newsweek, "Why Obama Should Learn to Love the Bomb," provides a novel but frivolous argument that nuclear weapons "may not, in fact, make the world more dangerous…." Rather, in Tepperman's world, "The bomb may actually make us safer." Tepperman shares this world with Kenneth Waltz, a University of California professor emeritus of political science, who Tepperman describes as "the leading 'nuclear optimist.'" Waltz expresses his optimism in this way: "We've now had 64 years of experience since Hiroshima. It's striking and against all historical precedent that for that substantial period, there has not been any war among nuclear states." Actually, **there were a number of proxy wars between nuclear weapons states, such as those in Korea, Vietnam and Afghanistan, and some near disasters, the most notable being the 1962 Cuban Missile Crisis. Waltz's logic is akin to observing a man falling from a high rise building, and noting that he had already fallen for 64 floors without anything bad happening to him, and concluding that so far it looked so good that others should try it. Dangerous logic!** Tepperman builds upon Waltz's logic, and concludes "that all states are rational," even though their leaders may have a lot of bad qualities, including being "stupid, petty, venal, even evil…." **He asks us to trust that rationality will always prevail when there is a risk of nuclear retaliation, because these weapons make "the costs of war obvious, inevitable, and unacceptable." Actually, he is asking us to do more than trust in the rationality of leaders; he is asking us to gamble the future on this proposition. "The iron logic of deterrence and mutually assured destruction is so compelling,"** Tepperman argues, "it's led to what's known as the nuclear peace…." But if this is a peace worthy of the name, which it isn't, it certainly is not one on which to risk the future of civilization. **One irrational leader with control over a nuclear arsenal could start a nuclear conflagration, resulting in a global Hiroshima.** Tepperman celebrates "the iron logic of deterrence," but **deterrence is a theory that is far from rooted in "iron logic." It is a theory based upon threats that must be effectively communicated and believed**. Leaders of Country A with nuclear weapons must communicate to other countries (B, C, etc.) the conditions under which A will retaliate with nuclear weapons. The leaders of the other countries must understand and believe the threat from Country A will, in fact, be carried out. **The longer that nuclear weapons are not used, the more other countries may come to believe that they can challenge Country A with impunity from nuclear retaliation**. The more that Country A bullies other countries, the greater the incentive for these countries to develop their own nuclear arsenals. **Deterrence is unstable and therefore precarious**. Most of the countries in the world reject the argument, made most prominently by Kenneth Waltz, that the spread of nuclear weapons makes the world safer. These countries joined together in the Nuclear Non-Proliferation Treaty (NPT) to prevent the spread of nuclear weapons, but they never agreed to maintain indefinitely a system of nuclear apartheid in which some states possess nuclear weapons and others are prohibited from doing so. The principal bargain of the NPT requires the five NPT nuclear weapons states (US, Russia, UK, France and China) to engage in good faith negotiations for nuclear disarmament, and the International Court of Justice interpreted this to mean complete nuclear disarmament in all its aspects. Tepperman seems to be arguing that seeking to prevent the proliferation of nuclear weapons is bad policy, and that nuclear weapons, because of their threat, make efforts at non-proliferation unnecessary and even unwise. **If some additional states**, including Iran, **developed nuclear arsenals**, he

concludes that wouldn't be so bad "given the way that bombs tend to mellow behavior." Those who oppose Tepperman's favorable disposition toward the bomb, he refers to as "nuclear pessimists." These would be the people, and I would certainly be one of them, who see nuclear weapons as presenting an urgent danger to our security, our species and our future. Tepperman finds that when viewed from his "nuclear optimist" perspective, "nuclear weapons start to seem a lot less frightening." "Nuclear peace," he tells us, "rests on a scary bargain: **you accept** a small chance that something extremely bad will happen in exchange for a much bigger chance that something very bad – conventional war – won't happen." But the "extremely bad" thing he asks us to accept is **the end of the human species**. Yes, that would be serious. He also doesn't make the case that in a world without nuclear weapons, the prospects of conventional war would increase dramatically. After all, **it is only an unproven supposition that nuclear weapons have prevented wars, or would do so in the future. We have certainly come far too close to the precipice of catastrophic nuclear war**. As an ultimate celebration of the faulty logic of deterrence, Tepperman calls for providing any nuclear weapons state with a "survivable second strike option." Thus, he not only favors nuclear weapons, but finds the security of these weapons to trump human security. Presumably he would have President Obama providing new and secure nuclear weapons to North Korea, Pakistan and any other nuclear weapons states that come along so that they will feel secure enough not to use their weapons in a first-strike attack. Do we really want to bet the human future that Kim Jong-Il and his successors are more rational than Mr. Tepperman?

Nuclear Proliferation Causes Extinction

Utgoff 02

Victor Utgoff, Deputy Director of the Strategy, Forces, and Resources Division of the Institute for Defense Analysis, Survival, Fall,2002, p. 87-90

First, **the dynamics of getting to a highly proliferated world could be very dangerous. Proliferating states will feel great pressures to obtain nuclear weapons and delivery systems before any potential opponent does. Those who succeed in outracing an opponent may consider preemptive nuclear war before the opponent becomes capable of nuclear retaliation**. Those who lag behind might try to preempt their opponent's nuclear programme or defeat the opponent using conventional forces. And those who feel threatened but are incapable of building nuclear weapons may still be able to join in this arms race by building other types of weapons of mass destruction, such as biological weapons. Second, **as the world approaches complete proliferation, the hazards posed by nuclear weapons today will be magnified many times over**. Fifty or more nations capable of launching nuclear weapons means that the risk of nuclear accidents that could cause serious damage not only to their own populations and environments, but those of others, is hugely increased. The chances of such weapons falling into the hands of renegade military units or terrorists is far greater, as is the number of nations carrying out hazardous manufacturing and storage activities. Increased prospects for the occasional nuclear shootout Worse still, **in a highly proliferated world there would be more frequent opportunities for the use of nuclear weapons** And more frequent opportunities means shorter expected times between conflicts in which nuclear weapons get used, unless the probability of use at any opportunity is actually zero. To be sure, some theorists on nuclear deterrence appear to think that in any confrontation between two states known to have reliable nuclear capabilities, the probability of nuclear weapons being used is zero.' These theorists think that such states will be so fearful of escalation to nuclear war that they would always avoid or terminate confrontations between them, short of even conventional war. They believe this to be true even if the two states have different cultures or leaders with very eccentric personalities. History and human nature, however, suggest that they are almost surely wrong. History includes instances in which states known to possess nuclear weapons did engage in direct conventional conflict. China and Russia fought battles along their common border even after both had nuclear weapons. Moreover, logic suggests that if states with nuclear weapons always avoided conflict with one another, surely states without nuclear weapons would avoid conflict with states that had them. Again, history provides counter-examples. Egypt attacked Israel in 1973 even though it saw Israel as a nuclear power at the time. Argentina invaded the Falkland Islands and fought Britain's efforts to take them back, even though Britain had nuclear weapons. Those who claim that two states with reliable nuclear capabilities to devastate each other will not engage in conventional conflict risking nuclear war also assume that any leader from any culture would not choose suicide for his nation. But history provides unhappy examples of states whose leaders were ready to choose suicide for themselves and their fellow citizens. Hitler tried to impose a 'victory or destruction' policy on his people as Nazi Germany was going down to defeat.' And Japan's war minister, during debates on how to respond to the American atomic bombing, suggested 'Would it not be wondrous for the whole nation to be destroyed like a beautiful flower?" If leaders are willing to engage in conflict with nuclear-armed nations, use of nuclear weapons in any particular instance may not be likely, but its probability would still be dangerously significant. In particular, human nature suggests that the threat of retaliation with nuclear weapons is not a reliable guarantee against a disastrous first use of these weapons. While national leaders and their advisors everywhere are usually talented and experienced people, even their most important decisions cannot be counted on to be the product of well-informed and thorough assessments of all options from all relevant points of view. This is especially so when the stakes are so large as to defy assessment and there are substantial pressures to act quickly, as could be expected in intense and fast-moving crises between nuclear-armed states .6 Instead, like other human beings, national leaders can be seduced by wishful thinking. They can misinterpret the words or actions of opposing leaders. Their advisors may produce answers that they think the leader wants to hear, or coalesce around what they know is an inferior decision because the group urgently needs the confidence or the sharing of responsibility that results from settling on something. Moreover, leaders may not recognise clearly where their personal or party interests diverge from those of their citizens. Under great stress, human beings can lose their ability to think carefully. They can refuse to believe that the worst could really happen, oversimplify the problem at hand, think in terms of simplistic analogies and play hunches. The intuitive rules for how individuals should respond to insults or signs of weakness in an opponent may too readily suggest a rash course of action. Anger, fear, greed, ambition and pride can all lead to bad decisions. The desire for a decisive solution to the problem at hand may lead to an unnecessarily extreme course of action. We can almost hear the kinds of words that could flow from discussions in nuclear crises or war. 'These people are not willing to die for this interest'. 'No sane person would actually use such weapons'. 'Perhaps the opponent will back down if we show him we mean business by demonstrating a willingness to use nuclear weapons'. 'If I don't hit them back really hard, I am going to be driven from office, if not killed'. Whether right or wrong, in the stressful atmosphere of a nuclear crisis or war, such words from others, or silently from within, might resonate too readily with a harried leader. Thus, both history and human nature suggest that nuclear deterrence can be expected to fail from time to time, and we are fortunate it has not happened yet. But the threat of nuclear war is not just a matter of a few weapons being used. It could get much worse. Once a conflict reaches the point where nuclear weapons are employed, the stresses felt by the leaderships would rise enormously. These stresses can be expected to further degrade their decision-making. The pressures to force the enemy to stop fighting or to surrender could argue for more forceful and decisive military action, which might be the right thing to do in the circumstances, but maybe not. And the horrors of the carnage already suffered may be seen as justification for visiting the most devastating punishment possible on the enemy.' Again, history demonstrates how intense conflict can lead the combatants to escalate violence to the maximum possible levels. In the Second World War, early promises not to bomb cities soon gave way to essentially indiscriminate bombing of civilians. The war between Iran and Iraq during the 1980s led to the use of chemical weapons on both sides and exchanges of missiles against each other's cities. And more recently, violence in the Middle East escalated in a few months from rocks and small arms to heavy weapons on one side, and from police actions to air strikes and armoured attacks on the other. Escalation of violence is also basic human nature. Once the violence starts, retaliatory exchanges of violent acts can escalate to levels unimagined by the participants beforehand.' Intense and blinding anger is a common response to fear or humiliation or abuse. And such anger can lead us t0 impose on our opponents whatever levels of violence are readily accessible. In sum, **widespread proliferation is likely to lead to an occasional shoot-out with nuclear weapons, and that such shoot-**

outs will have a substantial probability of escalating to the maximum destruction possible with the weapons at hand. Unless nuclear proliferation is stopped, we are headed toward a world that will mirror the American Wild West of the late 1800s. With most, if not all, nations wearing nuclear 'six-shooters' on their hips, the world may even be a more polite place than it is today, but **every once in a while we will all gather on a hill to bury the bodies of dead cities or even whole nations.**

Case/ Addons

Hegemony Advantage

1NC

The DOD won't deploy SMR's - doesn't solve

Wong '12 (Kelvin Wong, Kelvin Wong is an Associate Research Fellow at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University. He is with the Military Studies Programme at the School's constituent unit, the Institute of Defence and Strategic Studies, "The Military's Quest for Nuclear Power", http://rolandsanjuan.blogspot.com/2012/05/beyond-weapons-militarys-quest-for.html, May 18, 2012)

Synopsis The military has always maintained an interest in the application of nuclear energy in its operations. **In a bid to reduce logistical** strain caused by power-hungry bases and vehicles operating over significant distances**, some military forces have experimented with nuclear technology to seek potential solutions. However, it is unlikely that such concepts will become a mainstream reality.** Commentary In April 2012 American scientists unveiled a radical plan for advanced unmanned aerial vehicles (UAV) powered by 'next generation concepts'. The proposal, titled 'Unmanned Air Vehicle Ultra Persistence Research' was jointly developed by Sandia National Laboratories – the US government's principal nuclear research and development agency – and military contractor Northrop Grumman. The research team noted that the application of such persistent technologies to UAVs would dramatically extend flight times, as well as enable more powerful sensor and weapon systems to be fitted. The proposal all but established that the team had been experimenting with nuclear propulsion concepts, especially when considering Sandia's background and the research team's concern over political sensitivities of nuclear power. Nuclear power: more than destruction Military exploitation of nuclear power has not always been limited to weapons of mass destruction and large naval platforms. As early as the 1940s, American scientists experimented with a salt-based nuclear reactor concept for civilian aircraft propulsion. However, early designs lacked durability and it was not till 1954 that a stable reactor was built at the Oak Ridge National Laboratory. During the Cold War, both the United States and the Soviet Union experimented with nuclear technology for its military aircraft, with the same intention to develop intercontinental bombers capable of reaching virtually any target on the planet. American defence contractors at the behest of the United States Air Force (USAF) investigated the feasibility of nuclear powered military aircraft, which was never realised as a result of cost and technical limitations, as well as crew safety concerns. On the other side of the Bering Strait, the Soviet Union also pursued its own nuclear-powered aircraft development. Despite promising results from limited flight-testing, Soviet military interest in the nuclear-powered bomber soon faded in favour of more cost-effective ballistic missile systems. There had also been an interest in the application of nuclear power for land-based forces during the same period. From early 1950 to late 1970 the US military had investigated the possibility of deploying smaller-scale and portable nuclear reactors in a bid to reduce logistical challenges imposed by energy-dependent vehicles and military bases. For example, a 1963 study submitted to the US Department of Defense (DOD) proposed the use of a small nuclear reactor as the power source for an energy depot. The proposal, called the military compact reactor (MCR), was an attempt to solve the logistics problem of supplying fuel to military vehicles on the battlefield. While military vehicles could not derive power directly from the nuclear reactor, the MCR could provide power to produce synthetic fuel to replace conventional petroleum fuel. In addition to the MCR, US Army engineers had also successfully operated a series of compact nuclear reactors in remote military bases, and even considered the use of nuclear power overseas to provide uninterrupted power in the event that US bases were cut off from regular supply lines. However, further development of the MCR ceased due to the cost and technical limitations. Other concepts had been more successful. From 1968 to 1975, the US Army operated a floating nuclear reactor which supplied electrical power in the Panama Canal Zone. Even though it proved its worth, the floating reactor eventually ceased operation due to high costs and the cancellation of the Army's nuclear research programme. Civilian and military nuclear incidents Despite improvements in nuclear safety, public sentiment on nuclear power is generally unfavourable, particularly after a series of high-profile nuclear incidents over the years. Disasters like Chernobyl, Three Mile Island, and the recent Fukushima episodes have sorely demonstrated the perils of operating nuclear reactors, emanating be it from human error or natural calamities. Military forces have also been stung by peacetime nuclear incidents. In March 2008, the American nuclear submarine USS Houston leaked minute amounts of radiation into Sasebo naval base while on a port call, triggering condemnation from Japanese citizens in the district. In the same year, the British nuclear submarine HMS Trafalgar leaked hundreds of litres of radioactive wastewater into a nearby river while docked at Devonport naval base, raising concerns from nuclear safety experts. Mainstream nuclear power in the military? **Yet military scientists have not ceased to be tempted by the potential of nuclear power**. In response to increasing oil prices and global supply uncertainties, and well-documented cases of logistical strain on forces operating in the Middle East in recent conflicts, **the US Defense Advanced Research Projects Agency (DARPA) issued a proposal for innovative solutions in deployable compact nuclear reactors in 2010**. In the proposal, DARPA outlined the need to reduce the logistical burden of supplying forward operating bases and forces without access to reliable fuel supply lines. The proposal also suggested that materials science have advanced to the stage where it might have a positive impact on deployable nuclear reactor research. **While recent developments suggest that nuclear power technology can potentially be employed in unmanned aircraft and on the ground, it is unlikely to have mainstream military utility.** The Cold War period was an era when general attitudes towards nuclear energy were quite favourable, and military experimentation was only limited by funding and scientific

expertise. **In contrast, nuclear power today has become a hotly debated issue despite its importance in powering the economies of advanced nations today. For the military, the problem with nuclear power is not just about cost and safety, but also of the nature of its operating environment. Deploying volatile nuclear reactors into harm's way on the battlefield, where their destruction and sabotage are likely, should give military planners cause to pause.**

No military benefit of alt energy- the quals of this evidence overwhelms their evidence

Bartis and Bibber '11 (James T. Bartis, Senior policy researcher at the RAND Corporation. Bartis has more than 25 years of experience in policy analyses and technical assessments in energy and national security. His recent energy research topics include analyses of the international petroleum supply chain, assessments of alternative fuels for military and civilian applications, development prospects for coal-to-liquids and oil shale, energy and national security, Qatar's natural gas-to-diesel plants, Japan's energy policies, planning methods for long-range energy research and development, critical mining technologies, and national response options during international energy emergencies. Bartis joined the U.S. Department of Energy (DOE) in 1978 shortly after it was established, Before joining RAND, Bartis was vice president of Science Applications International Corporation and vice president and cofounder of Eos Technologies, Bartis received his Ph.D. in chemical physics from the Massachusetts Institute of Technology, Previous Positions: Vice President, Science Applications International Corporation; Vice President and Cofounder, Eos Technologies; Director, Policy and Planning Office of the Assistant Secretary for Fossil Energy, U.S. Department of Energy; Director, Divisions of Fossil Energy and Environment, Office of Policy and Evaluation, U.S. Department of Energy, Prepared for the Office of the Secretary of Defense, National Defense Research Institute, RAND Institute, "Alternative Fuels for Military Applications", 2011)

Findings on Military Use of Alternative Fuels **There is no direct benefit to the Department of Defense or the services from using alternative fuels rather than petroleum-derived fuels. Our analysis of forward-based production concepts indicated that none provide a compelling military benefit. In contrast, most, if not all, would increase the logistics burden on deployed units.** If a domestic alternative fuel industry does develop, alternative fuels will be sold at the then-prevailing fuel prices, which over the foreseeable future will be determined by crude oil prices in the world oil market. **There is no evidence that producers of alternative fuels will offer their products at lower or more stable prices than producers of petroleum-derived fuels.** Using climate-friendly alternative fuels in tactical weapon systems offers a means for DoD to greatly reduce greenhouse gas emissions. However, over at least the next decade, **the availability of climate-friendly alternative fuels will be limited by the prevailing technical uncertainties associated with large-scale commercial production. Diverting this limited production to DoD applications will likely result in less use in civilian applications, with nationwide greenhouse gas emissions being insensitive to the apportionment between civilian and military applications**. If Defense Department efforts in alternative fuel testing, research, and promoting early commercial production are successful, **the benefits of this work will accrue more to the nation as a whole rather than to DoD or the services. Alternative fuel use in DoD tactical systems offers national benefits in much the same way as do mandates for DoD to be an early user of renewable power at its installations.**

And their evidence is bias and overestimates key factors

Bartis and Bibber '11 (James T. Bartis, Senior policy researcher at the RAND Corporation. Bartis has more than 25 years of experience in policy analyses and technical assessments in energy and national security. His recent energy research topics include analyses of the international petroleum supply chain, assessments of alternative fuels for military and civilian applications, development prospects for coal-to-liquids and oil shale, energy and national security, Qatar's natural gas-to-diesel plants, Japan's energy policies, planning methods for long-range energy research and development, critical mining technologies, and national response options during international energy emergencies. Bartis joined the U.S. Department of Energy (DOE) in 1978 shortly after it was established, Before joining RAND, Bartis was vice president of Science Applications International Corporation and vice president and cofounder of Eos Technologies, Bartis received his Ph.D. in chemical physics from the Massachusetts Institute of Technology, Previous Positions: Vice President, Science Applications International Corporation; Vice President and Cofounder, Eos Technologies; Director, Policy and Planning Office of the Assistant Secretary for Fossil Energy, U.S. Department of Energy; Director, Divisions of Fossil Energy and Environment, Office of Policy and Evaluation,

U.S. Department of Energy, Prepared for the Office of the Secretary of Defense, National Defense Research Institute, RAND Institute, "Alternative Fuels for Military Applications", 2011)

Defense Department technology-development efforts overemphasize early demonstration and underestimate the difficulty of developing alternative fuel technologies that offer acceptable economic and environmental performance. Most of the DoD effort in alternative fuel development consists of a collection of independent projects, each focusing on a single engineering concept. **Most of these projects are geared toward demonstrating technical viability as opposed to affordable, environmentally sound production**. As decisionmakers in the U.S. Department of Energy have repeatedly learned, **demonstrating technical viability is easy**. **Demonstrating affordable and environmentally sound production is difficult and requires investments in the research necessary for true progress**, such as materials research, feedstock production research, and applied research dedicated to understanding fundamental problems and developing sound solutions.

Stability will survive without US hegemony

Fettweis '10 (Chris Fettweis, Professor of national security affairs @ U.S. Naval War College, Georgetown University Press, "Dangerous times?: the international politics of great power peace" Google Books)

Simply stated, the hegemonic stability theory proposes that international peace is only possible when there is one country strong enough to make and enforce a set of rules. At the height of Pax Romana between 27 BC and 180 AD, for example, Rome was able to bring unprecedented peace and security to the Mediterranean. The Pax Britannica of the nineteenth century brought a level of stability to the high seas. Perhaps the current era is peaceful because the United States has established a de facto Pax Americana where no power is strong enough to challenge its dominance, and because it has established a set of rules that a generally in the interests of all countries to follow. Without a benevolent hegemony, some strategists fear, instability may break out around the globe. Unchecked conflicts could cause humanitarian disaster and, in today's interconnected world economic turmoil that would ripple throughout global financial markets. If the United States were to abandon its commitments abroad, argued Art, the world would "become a more dangerous place" and, sooner or later, that would "rebound to America's detriment." If the massive spending that the United States engages in actually produces stability in the international political and economic systems, then perhaps internationalism is worthwhile. There are good theoretical and empirical reasons, however, the belief that U.S. hegemony is not the primary cause of the current era of stability. First of all, the hegemonic stability argument overstates the role that the United States plays in the system. No country is strong enough to police the world on its own. The only way there can be stability in the community of great powers is if self-policing occurs, ifs states have decided that their interest are served by peace. If no pacific normative shift had occurred among the great powers that was filtering down through the system, then no amount of international constabulary work by the United States could maintain stability. Likewise, if it is true that such a shift has occurred, then most of what the hegemon spends to bring stability would be wasted. The 5 percent of the world's population that live in the United States simple could not force peace upon an unwilling 95. At the risk of beating the metaphor to death, the United States may be patrolling a neighborhood that has already rid itself of crime. Stability and unipolarity may be simply **coincidental**. In order for U.S. hegemony to be the reason for global stability, the rest of the world would have to expect reward for good behavior and fear punishment for bad. Since the end of the Cold War, the United States has not always proven to be especially eager to engage in humanitarian interventions abroad. Even rather incontrovertible evidence of genocide has not been sufficient to inspire action. Hegemonic stability can only take credit for influence those decisions that would have ended in war without the presence, whether physical or psychological, of the United States. Ethiopia and Eritrea are

hardly the only states that could go to war without the slightest threat of U.S. intervention. Since most of the world today is free to fight without U.S. involvement, something else must be at work. Stability exists in many places where no hegemony is present. Second, the limited empirical evidence we have suggests that there is little connection between the relative level of U.S. activism and international stability. During the 1990s the United States cut back on its defense spending fairly substantially, By 1998 the United States was spending $100 billion less on defense in real terms than it had in 1990. To internationalists, defense hawks, and other believers in hegemonic stability this irresponsible "peace dividend" endangered both national and global security "No serious analyst of American military capabilities," argued Kristol and Kagan, "doubts that the defense budget has been cut much too far to meet Americas responsibilities to itself and to world peace."" If the pacific trends were due not to U.S. hegemony but a strengthening norm against interstate war, however, one would not have expected an increase in global instability and violence. The verdict from the past two decades is fairly plain: The world grew more peaceful while the United States cut its forces. No state seemed to believe that its security was endangered by a less-capable Pentagon, or at least none took any action that would suggest such a belief. No militaries were enhanced to address power vacuums; no security dilemmas drove mistrust and arms races; no regional balancing occurred once the stabilizing presence of the U.S. military was diminished. The rest of the world acted as if the threat ofinternational war was not a pressing concern, despite the reduction in U.S. capabilities. The incidence and magnitude of global conflict declined while the United States cut its military spending under President Clinton, and it kept declining as the Bush Administration ramped spending back up. No complex statistical analysis should be necessary to reach the conclusion that the two are unrelated. It is also worth noting for our purposes that the United States was no less safe.

Alt causes overwhelm or hegemony is resilient

Copley '12 (Gregory R., editor of Defense & Foreign Affairs' Strategic Policy, Strategic Policy in an Age of Global Realignment, lexis, June 2012)

3. Strategic Recovery by the US. **The US will not, in 2012 or 2013, show signs of any recovery of its global strategic credibility or real strength.** Its **manufacturing and science and technology** sectors **will continue to suffer from** low (even **declining) productivity and difficulty** in capital formation (for political reasons, primarily). A **significant US recovery is not feasible** in the timeframe given the present political and economic policies and impasse evident. **US allies will increasingly look to their own needs** while attempting to sustain their alliance relationship with the US to the extent feasible. **Those outside the US alliance network**, or peripheral to it, will **increasingly disregard US political/diplomatic pressures**, **and will seek to accommodate the PRC or regional actors**. The continued economic malaise of the US during 2012, even if disguised by modest nominal GDP growth, will make economic (and therefore strategic) recovery more difficult and ensure that it will take longer. In any event, **the fact that the US national debt exceeds the GDP hollows the dollar and thus makes meaningful recovery impossible** in the short-term. The attractiveness of a low dollar value in comparison to other currencies in making US manufacturing investment more feasible than in recent years is offset by declining US workforce productivity and political constraints which penalize investment in manufacturing, or even in achieving appealing conditions for capital formation. Banks are as afraid of such investment as are manufacturing investors themselves.

2NC- SMR's Irrelevant

Operational energy demands are not key to hegemony- ending wars in Afghanistan and Iraq have decreased necessity

Sarewitz et al '12 (Daniel Sarewitz and Samuel Thernstrom Co-Directors, John Alic Technical Consultant, and Writer Travis Doom Research Assistant, A joint project of CSPO and CATF, We are grateful for their time and their insights. Fred Beach Postdoctoral Fellow, University of Texas at Austin William Bonvillian Washington Office Director, Massachusetts Institute of Technology Hanna Breetz PhD Candidate, Massachusetts Institute of Technology Kay Sullivan Faith Graduate Fellow, RAND Erica Fuchs Assistant Professor of Engineering and Public Policy, Carnegie Mellon University Ken Gabriel Deputy Director, Defense Advanced Research Project Agency Anthony Galasso Director of Advanced Integration Capabilities, Boeing Phantom Works David Garman Consultant Eugene Gholz Associate Professor of Public Affairs, University of Texas at Austin Sherri Goodman Senior Vice President, Center for Naval Analysis Kevin Hurst Assistant Director for Energy R&D, Office of Science and Technology Policy John Jennings Deputy Director for Innovation, Office of the Assistant Secretary of Defense, Operational Energy Todd Laporte Professor of Political Science, University of California Berkley George Lea Military Branch Chief, Engineering and Construction, U.S. Army Corps of Engineers Sasha Mackler Bipartisan Policy Center Jeffrey Marqusee Executive Director, SERDP and ESTCP, U.S. Department of Defense William McQuaid Liaison for DoD Energy Conservation Programs, Office of Management and Budget Srini Mirmira Commercialization, Advance Research Projects Agency-Energy Dorothy Robyn Deputy Under Secretary of Defense, Installations and Environment Richard Van Atta Institute for Defense Analyses Andrew Wiedlea Defense Threat Reduction Agency Aubrey Wigner Graduate Student, Arizona State University Project Staff and Affiliates Daniel Sarewitz Co-Director, Consortium for Science, Policy and Outcomes, Arizona State University Samuel Thernstrom Senior Climate Policy Advisor, Clean Air Task Force John Alic Consultant Travis Doom Program Specialist, Consortium for Science, Policy and Outcomes, Arizona State University Joseph Chaisson Research and Technical Director, Clean Air Task Force Armond Cohen Executive Director, Clean Air Task Force Nate Gorence Associate Director for Energy Innovation, Bipartisan Policy Center Suzanne Landtiser Graphic Designer, Fine Line Studio, "Energy Innovation At The Department Of Defense Assessing The Opportunities", March 2012,)

The Defense Industry and Energy Innovation Operational energy seems especially important and exciting right now, because the United States is at war—and even more than that, because the current wars happen to involve a type of fighting with troops deployed to isolated outposts far from their home bases, in an extreme geography that stresses the logistics system. But **as the U.S. effort in Afghanistan draws down, energy consumption in operations will account for less of total energy consumption**, **meaning that operational energy innovations will have less effect on energy security**. More important, **operational energy innovations will be of less interest to the military customers**, **who are unlikely to emphasize planning for a repeat of such an extreme situation as the war in Afghanistan**. Specific military organizations that have an interest in preparing to fight with a light footprint in austere conditions may well continue the operational energy emphasis of the past few years. The **good news for advocates of military demand pull for energy innovation is that** special operations forces are **viewed as the heroes of the recent wars, making them politically popular**. They also have their own budget lines that are less likely to be swallowed by more prosaic needs like paying for infrastructure at a time of declining defense budgets or by shifting strategic emphasis toward traditional high-intensity combat. While the conventional military's attention moves to preparation against a rising near-peer competitor in China—a possible future, if not the only one, for American strategic planning—special operations may still want lightweight, powerful batteries and solar panels. Working with industry for defense-led energy innovation requires treading a fine line. **Advocates need to understand the critical tasks facing specific military organizations, meaning that they have to live in the world of military jargon, strategic thinking, and budget politics**. At the same time, the advocates need to be able to reach nontraditional suppliers who have no interest in military culture and are developing technologies that follow performance trajectories totally different from the established military systems. More likely, it will not be the advocates who develop the knowledge to bridge the two groups, their understandings of their critical tasks, and the ways they communicate and contract. It will be the prime contractors, if their military customers want them to respond to a demand for energy innovation.

No risk oil shocks hamstring the military- DOD purchasing power checks

Sarewitz et al '12 (Daniel Sarewitz and Samuel Thernstrom Co-Directors, John Alic Technical Consultant, and Writer Travis Doom Research Assistant, A joint project of CSPO and CATF, We are grateful for their time and their insights. Fred Beach Postdoctoral Fellow, University of Texas at Austin William Bonvillian Washington Office Director, Massachusetts Institute of Technology Hanna Breetz PhD Candidate, Massachusetts Institute of Technology

Kay Sullivan Faith Graduate Fellow, RAND Erica Fuchs Assistant Professor of Engineering and Public Policy, Carnegie Mellon University Ken Gabriel Deputy Director, Defense Advanced Research Project Agency Anthony Galasso Director of Advanced Integration Capabilities, Boeing Phantom Works David Garman Consultant Eugene Gholz Associate Professor of Public Affairs, University of Texas at Austin Sherri Goodman Senior Vice President, Center for Naval Analysis Kevin Hurst Assistant Director for Energy R&D, Office of Science and Technology Policy John Jennings Deputy Director for Innovation, Office of the Assistant Secretary of Defense, Operational Energy Todd Laporte Professor of Political Science, University of California Berkley George Lea Military Branch Chief, Engineering and Construction, U.S. Army Corps of Engineers Sasha Mackler Bipartisan Policy Center Jeffrey Marqusee Executive Director, SERDP and ESTCP, U.S. Department of Defense William McQuaid Liaison for DoD Energy Conservation Programs, Office of Management and Budget Srini Mirmira Commercialization, Advance Research Projects Agency-Energy Dorothy Robyn Deputy Under Secretary of Defense, Installations and Environment Richard Van Atta Institute for Defense Analyses Andrew Wiedlea Defense Threat Reduction Agency Aubrey Wigner Graduate Student, Arizona State University Project Staff and Affiliates Daniel Sarewitz Co-Director, Consortium for Science, Policy and Outcomes, Arizona State University Samuel Thernstrom Senior Climate Policy Advisor, Clean Air Task Force John Alic Consultant Travis Doom Program Specialist, Consortium for Science, Policy and Outcomes, Arizona State University Joseph Chaisson Research and Technical Director, Clean Air Task Force Armond Cohen Executive Director, Clean Air Task Force Nate Gorence Associate Director for Energy Innovation, Bipartisan Policy Center Suzanne Landtiser Graphic Designer, Fine Line Studio, "Energy Innovation At The Department Of Defense Assessing The Opportunities", March 2012,)

In any event, **should serious bottlenecks in fuel supplies appear, the United States will be less vulnerable than many other countries, including major allies. The U.S. government can expect to outbid competing customers, beginning with poor countries totally dependent on imported oil and including wealthy economies such as Japan that benefit from the U.S. security umbrella. So long as there is fuel to buy** (or commandeer, in war), **DoD will be better able to afford it than almost any other customer. The armed forces have first claim on the Strategic Petroleum Reserve. Household consumers and airlines have more to fear from supply constrictions and price rises than DoD**.

Grid segmented- no impact

Leger 7-31-12 [Donna Leinwand Leger, USA Today, "Energy experts say blackout like India's is unlikely in U.S.," http://www.usatoday.com/news/nation/story/2012-07-31/usa-india-power-outage/56622978/1]

A massive, countrywide power failure like the one in India on Tuesday **is "extremely unlikely" in the United States, energy experts say**. In India, three of the country's government-operated power grids failed Tuesday, leaving 620 million people without electricity for several hours. The outage, the second in two days in the country of 1.21 billion people, is the world's biggest blackout on record. **The U.S. electricity system is segmented into three parts with safeguards that prevent an outage in one system from tripping a blackout in another system, "making blackouts across the country extremely unlikely**," Energy Department spokeswoman Keri Fulton said. Early reports from government officials in India say excessive demand knocked the country's power generators offline. Experts say India's industry and economy are growing faster than its electrical systems. Last year, the economy grew 7.8% and pushed energy needs higher, but electricity generation did not keep pace, government records show. "**We are much, much less at risk for something like that happening here, especially from the perspective of demand exceeding supply," said** Gregory **Reed, a professor of electric power engineering at University of Pittsburgh. "We're much more sophisticated in our operations. Most of our issues have been from natural disasters." The U.S. generates more than enough electricity to meet demand and always have power in reserve, Reed said. "Fundamentally, it's a different world here," said** Arshad **Mansoor, senior vice president of the Electric Power Research Institute in Washington and an expert on power grids. "It's an order of magnitude more reliable here than in a developing country**." Grid operators across the country analyze power usage and generation, factoring outside factors such as weather, in real time and can forecast power supply and demand hour by hour, Mansoor said. "In any large, complex interactive network, the chance of that interconnection breaking up is always there," Mansoor said. "You cannot take your eye off the ball for a minute." Widespread outages in the U.S. caused by weather are common. But **the U.S. has also had system failures**, said Ellen Vancko, senior energy adviser for the Union of Concerned Scientists, based in Washington. **On Aug. 14, 2003, more than 50 million people in the Northeast**

and Canada lost power after a major U.S. grid collapsed. The problem began in Ohio when a transmission wire overheated and sagged into a tree that had grown too close to the line, Vancko said. **That caused other power lines to overheat until so many lines failed that the system shut itself down, she said. "That was less a failure of technology and more a failure of people, a failure of people to follow the rules," Vancko said. "There were a whole bunch of lessons learned." In 2005, in response to an investigation of the blackout, Congress passed a law establishing the** North American Electric Reliability Corporation (**NERC**) **to enforce reliability standards for bulk electricity generation**.

No risk of supply bottlenecks

Alic '12 (John, Writes and consults on policy issues related to technology and science. As a staff member at the congressional Office of Technology Assessme, "ENERGY INNOVATION at the DEPARTMENT of DEFENSE ASSESSING THE OPPORTUNITIES, CONSORTIUM FOR SCIENCE, POLICY AND OUTCOMES at Arizona State University)

In any event, **should serious bottlenecks in fuel supplies appear, the United States will be less vulnerable than** many **other countries**, including major allies. **The U.S. government can expect to outbid competing customers, beginning with poor countries totally dependent on imported oil and including wealthy economies such as Japan that benefit from the U.S. security umbrella**. **So long as there is fuel to buy** (or commandeer, in war**), DoD will be better able to afford it than** almost **any other customer**. **The armed forces have first claim on the Strategic Petroleum Reserve.** Household consumers and airlines have more to fear from supply constrictions and price rises than DoD.

2NC- Hegemony Impact Defense

History disproves effective deterrence

Kober '10 (Stanley Kober, Research Fellow in foreign policy studies at the Cato Institute, "The Deterrence Illusion" http://www.cato.org/pub_display.php?pub_id=11898, June 13, 2010)

The world at the beginning of the 21st century bears an eerie — and disquieting — resemblance to Europe at the beginning of the last century.
That was also an era of globalisation. New technologies for transportation and communication were transforming the world. Europeans had lived so long in peace that war seemed irrational. And they were right, up to a point. The first world war was the product of a mode of rational thinking that went badly off course. The peace of Europe was based on security assurances. Germany was the protector of Austria-Hungary, and Russia was the protector of Serbia. The prospect of escalation was supposed to prevent war, and it did — until, finally, it didn't. The Russians, who should have been deterred — they had suffered a terrible defeat at the hands of Japan just a few years before — decided they had to come to the support of their fellow Slavs. As countries honoured their commitments, a system that was designed to prevent war instead widened it. We have also been living in an age of globalisation, especially since the end of the cold war, but it too is increasingly being challenged. And just like the situation at the beginning of the last century, deterrence is not working. Much is made, for example, of the North Atlantic Treaty Organisation (NATO) invoking Article V — the famous "three musketeers" pledge that an attack on one member is to be considered as an attack on all — following the terrorist attacks of September 11. But the United States is the most powerful member of NATO by far. Indeed, in 2001, it was widely considered to be a hegemon, a hyperpower. Other countries wanted to be in NATO because they felt an American guarantee would provide security. And yet it was the US that was attacked. This failure of deterrence has not received the attention it deserves. It is, after all, not unique. The North Vietnamese were not deterred by the American guarantee to South Vietnam. Similarly, Hezbollah was not deterred in Lebanon in the 1980s, and American forces were assaulted in Somalia. What has been going wrong? The successful deterrence of the superpowers during the cold war led to the belief that if such powerful countries could be deterred, then lesser powers should fall into line when confronted with an overwhelmingly powerful adversary. It is plausible, but it may be too rational. For all their ideological differences, the US and the Soviet Union observed red lines during the cold war. There were crises — Berlin, Cuba, to name a couple — but these did not touch on emotional issues or vital interests, so that compromise and retreat were possible. Indeed, what we may have missed in the west is the importance of retreat in Soviet ideology. "Victory is impossible unless [the revolutionary parties] have learned both how to attack and how to retreat properly," Lenin wrote in Left-Wing Communism: An Infantile Disorder. When the Soviets retreated, the US took the credit. Deterrence worked. But what if retreat was part of the plan all along? What if, in other words, the Soviet Union was the exception rather than the rule? That question is more urgent because, in the post-cold war world, the US has expanded its security guarantees, even as its enemies show they are not impressed. The Iraqi insurgents were not intimidated by President Bush's challenge to "bring 'em on". The Taliban have made an extraordinary comeback from oblivion and show no respect for American power. North Korea is demonstrating increasing belligerence. And yet the US keeps emphasising security through alliances. "We believe that there are certain commitments, as we saw in a bipartisan basis to NATO, that need to be embedded in the DNA of American foreign policy," secretary of state Hillary Clinton affirmed in introducing the new National Security Strategy. But that was the reason the US was in Vietnam. It had a bipartisan commitment to South Vietnam under the Southeast Asia Treaty Organisation, reaffirmed through the Tonkin Gulf Resolution, which passed Congress with only two dissenting votes. It didn't

work, and found its commitments were not embedded in its DNA. Americans turned against the war, Secretary Clinton among them. The great powers could not guarantee peace in Europe a century ago, and the US could not guarantee it in Asia a half-century ago.

No potential conflicts for hotspots to escilate

Fettweis '11 (Christopher J. Fettweis, Department of Political Science, Tulane University, Free Riding or Restraint? Examining European Grand Strategy, Comparative Strategy, 30:316–332, EBSCO, September 26, 2011)

Assertions that without the combination of U.S. capabilities, presence and commitments instability would return to Europe and the Pacific Rim **are** usually **rendered in** rather **vague language**. If the United States were to decrease its commitments abroad, argued Robert Art, "**the world will become a more dangerous** place and, sooner or later, that will redound to America's detriment."53 **From where would this danger arise? Who precisely would do the fighting, and over what issues**? Without the United States, would Europe really descend into Hobbesian anarchy? Would the Japanese attack mainland China again, to see if they could fare better this time around? Would the Germans and French have another go at it? In other words, **where exactly is hegemony is keeping the peace?** With one exception, these questions are rarely addressed. That exception is in the Pacific Rim. Some analysts fear that a de facto surrender of U.S. hegemony would lead to a rise of Chinese influence. Bradley Thayer worries that Chinese would become "the language of diplomacy, trade and commerce, transportation and navigation, the internet, world sport, and global culture," and that Beijing would come to "dominate science and technology, in all its forms" to the extent that soon the world would witness a Chinese astronaut who not only travels to the Moon, but "plants the communist flag on Mars, and perhaps other planets in the future."54 Indeed China is the only other major power that has increased its military spending since the end of the Cold War, even if it still is only about 2 percent of its GDP. Such levels of effort do not suggest a desire to compete with, much less supplant, the United States. **The much-ballyhooed, decade-long military buildup has brought Chinese spending up to** somewhere between **one-tenth** and one-fifth of **the U.S. level**. **It is hardly clear that a restrained United States would invite Chinese regional, must less global, political expansion**. Fortunately one need not ponder for too long the horrible specter of a red flag on Venus, since on the planet Earth, where war is no longer the dominant form of conflict resolution, **the threats posed by even a rising China would not be terribly dire**. The dangers contained in the terrestrial security environment are less severe than ever before. Believers in the pacifying power of hegemony ought to keep in mind a rather basic tenet: When it comes to policymaking, **specific threats are more significant than vague, unnamed dangers**. **Without specific risks, it is just as plausible to interpret U.S. presence as redundant, as overseeing a peace that has already arrived. Strategy should not be based upon vague images emerging from the dark reaches of the neoconservative imagination**. Overestimating Our Importance One of the most **basic** insights of cognitive **psychology provides the final reason to doubt** the power of **hegemonic stability: Rarely are our actions as consequential** upon their behavior **as we perceive them to be.** A great deal of experimental evidence exists to support the notion that people (and therefore **states**) tend to **overrate the degree to which their behavior is responsible for the actions of others**. Robert Jervis has argued that two processes account for this overestimation, both of which would seem to be especially relevant in the U.S. case.55 First, believing that we are responsible for their actions gratifies our national ego (which is not small to begin with; the United States is exceptional in its exceptionalism). The hubris of the United States, long appreciated and noted, has only grown with the collapse of the Soviet Union.56 U.S. policymakers famously have comparatively little knowledge of—or interest in—events that occur outside of their own borders. **If there is any state vulnerable to the overestimation of its importance**

due to the fundamental misunderstanding of the motivation of others, it would have to **be the U**nited **S**tates. Second, **policymakers** in the United States **are far more familiar with our actions** than they are with the decision-making processes of our allies. Try as we might, **it is not possible to fully understand the threats, challenges, and opportunities that our allies see from their perspective**. The European great powers have domestic politics as complex as ours, and they also have competent, capable strategists to chart their way forward. They react to many international forces, of which U.S. behavior is only one. **Therefore**, for any actor trying to make sense of the action of others, Jervis notes, "in the absence of strong evidence to the contrary, **the most obvious and parsimonious explanation is that he was responsible**."57 **It is natural, therefore, for U.S. policymakers** and strategists **to believe** that the **behavior o**f our **allies** (**and rivals) is shaped** largely **by** what **Washington** does. Presumably Americans are at least as susceptible to the overestimation of their ability as any other people, and perhaps more so. At the very least, political psychologists tell us, **we are** probably **not as important to them as we think**. **The importance of U.S. hegemony in contributing to international stability is** therefore almost certainly **overrated**. In the end, one can never be sure why our major allies have not gone to, and do not even plan for, war. Like deterrence, the **hegemonic stability theory rests on faith**; **it can only be falsified, never proven**. It does not seem likely, however, that hegemony could fully account for twenty years of strategic decisions made in allied capitals if the international system were not already a remarkably peaceful place. Perhaps these states have no intention of fighting one another to begin with, and our commitments are redundant. European great powers may well have chosen strategic restraint because they feel that their security is all but assured, with or without the United States.

No US lashout

MacDonald '11 (Paul K. MacDonald**,** Assistant Professor of Political Science at Williams College, and Joseph M. Parent, Assistant Professor of Political Science at the University of Miami, "Graceful Decline?: The Surprising Success of Great Power Retrenchment," International Security, Vol. 35, No. 4, p. 7-44, Spring 2011)

With regard to militarized disputes, **declining great powers demonstrate more caution and restraint in the use of force**: **they were involved in** an average of 1.7 **fewer militarized disputes in the five years following ordinal change compared with other great powers** over similar periods.67 **Declining great powers** also **initiated fewer militarized disputes**, **and their disputes tended to escalate to lower levels of hostility than the baseline category** (see figure 2).68 **These findings suggest** the need for a **fundamental revision to the pessimist's argument regarding the war proneness of declining powers**.69 **Far from being more likely to lash out** aggressively, **declining states refrain from initiating and escalating military disputes**. **Nor do declining great powers appear more vulnerable to external predation** than other great powers. This may be because **external predators have great difficulty assessing the vulnerability of potential victims,** or because **retrenchment allows vulnerable powers to effectively recover from decline and still deter potential challengers.**

Competitiveness

AT: Competitiveness

Alt causes to competitiveness-

The debt crisis

Goff 9-7-12 [Emily, Research Associate at The Heritage Foundation, "U.S. Falls in World Economic Competitiveness Rankings," http://blog.heritage.org/2012/09/07/u-s-falls-in-world-economic-competitiveness-rankings/]

The United States' competitive edge in the global economy is not what it used to be. The World Economic Forum (**WEF) reported that the U.S. dropped from fifth to seventh place**—the fourth consecutive year it has fallen in the rankings. **Chief among the reasons is the** one-two punch of skyrocketing **debt** and uncertainty among businesses that Washington will address the country's fiscal and economic problems. Gee, that sounds familiar. National **debt recently cruised past the $16 trillion mark and is continuing its ascent toward the current debt limit of $16.394 trillion. It has already eclipsed the size of the entire U.S. economy**. Reaching the debt limit again will serve as a grave reminder that Washington's spending spree and failure to reform entitlement programs that are driving spending is wreaking havoc on the budget. That not only threatens to saddle future generations with crushing levels of debt—and taxes to pay for it—but also compromises the health of the U.S. economy right now. Such **irresponsibility in Washington**—**manifest in over-spending, huge and chronic budget deficits, and massive debt—diminishes the business community's trust that the government can and will get the country's fiscal house in order**. **Whether it is a failure to stave off Taxmageddon's tax hikes now, rein in federal spending, or reprioritize the sequestration's automatic spending cuts scheduled to deliver a serious blow to our national defense, Washington is only generating the bad kind of uncertainty—and lots of it. Because there is such distrust of political leaders and institutions,** and government is grossly misusing its resources, businesses, **investors, and families feel their hands are tied**. Tepid economic growth results—a point we see reinforced by the latest in a slew of mediocre jobs reports. The Heritage Foundation's own Index of Economic Freedom tells a similar story: **The U.S. dropped to tenth place in 2012 and has been relegated from a "free" status to "mostly free." As the Index authors write: Restoring the U.S. economy to the status of a "free" economy will require significant policy changes** to reduce the size of government, overhaul the tax system, and transform costly entitlement programs. **While certain measures of competitiveness in the U.S. remain strong, the overall trend is headed in the wrong direction.** If for some reason Congress and the President needed additional urging to address these "escalating and unaddressed weaknesses," as the WEF report calls them, this year's report should do just that.

Poor education system

Harvard Magazine '12 ["Capitalism Concerns," http://harvardmagazine.com/2012/01/harvard-business-school-survey-weaker-u-s-economic-competitiveness]

AT A TIME of deep concern about unemployment, the American economy, and the federal budget, Harvard Business School's U.S. Competitiveness Project—announced on December 13—today published "Prosperity at Risk," a sobering assessment of American business competitiveness, based on nearly 10,000 responses to a survey of 50,000 alumni. It finds "**a series of structural changes that began well before the Great Recession** [of late 2007 to mid 2009] and **threaten to undermine the long-term competitiveness of the U.S."** The report's authors, project directors Michael E. Porter, Lawrence University Professor and a leader in the field of corporate strategy, and Jan W. Rivkin, Rauner professor of business administration, observe: **During the past year, more than 1,700 respondents were personally involved in decisions about whether to place business activities and jobs in the U.S. or elsewhere**. In these choices, the United States competed with virtually the entire world and fared poorly, losing two-thirds of the decisions that were resolved. Facilities involving large numbers of jobs, high-end work, and groups of activities located together moved out of the U.S. much faster than they moved in. That is, **it is not merely low-wage, low-skill employment that is vulnerable to competition**. Indeed, although the survey findings show that "low wage rates" were a leading reason for moving existing activities out of the United States, a **slightly larger portion of respondents cited "better access to skilled labor" for decisions to move activities from this country than for decisions to retain**

such activities (and their accompanying employment) in the United States. (Coincidentally, the National Science Foundation issued a report documenting decreases in state funding for public research universities, where a significant portion of U.S. engineering and technical education takes place; read the news release here. Developing nations, as widely reported, are significantly increasing their investment in such institutions and scientific, engineering, and technical training.) Although the respondents regarded American universities, the context for entrepreneurship, and the innovation infrastructure very favorably as they evaluated the business environment, **a majority held the American K-12 education system, political system, and tax code in very low regard.** Majorities felt that **regulation, economic policy, transportation infrastructure, the complexity of the tax code, K-12 education, and the effectiveness of the domestic political system were all factors in making the United States fall behind in competitive terms.** They found **far more signs of weak and deteriorating conditions than of strong or improving ones**. "For the first time in decades," Porter and Rivkin write of structural changes in the economy, "the business environment in the United States is in danger of falling behind the rest of the world," compounding pressure on jobs, wages, and living standards.

Laundry list

Porter and Rivkin '12 [Michael E. Porter is the Bishop William Lawrence University Professor and Jan W. Rivkin is the Bruce V. Rauner Professor of Business Administration at Harvard Business School, "The Looming Challenge to U.S. Competitiveness," http://hbr.org/2012/03/the-looming-challenge-to-us-competitiveness/ar/pr]

Productivity. America's long-run rate of growth in labor productivity was strong relative to that of other advanced economies in the late 1990s and early 2000s, but it **began to trail off before the financial crisis.** Productivity has been sustained since the crisis **largely by rising unemployment and falling workforce participation**, ominous signs for U.S. competitiveness. Job creation. Even more unsettling is the country's job-creation picture. **Long-term growth in private-sector employment has dipped to historically low levels**, a trend that started well before the Great Recession. (See the exhibit "Disappearing Job Growth.") **In industries exposed to international competition, job growth has virtually stopped. Wages. American wages have been under pressure for more than a decade.** In 2007, before the downturn, U.S. median household income stood below 1999 levels in real terms—and has fallen even more since. In the two decades prior to 2007, median income grew, but at an anemic annual rate of just 0.5%. Most affected have been middle- and lower-income workers, many of whom are more exposed to international competition today than ever before. International trade and investment. **The U.S. remains the world's largest recipient of foreign direct investment; however, growth in inbound FDI slowed** in recent years to **rates lower than those of many other** large advanced **economies**. And although U.S. exports rose during the past decade, America's share of world exports has declined substantially and in virtually all areas. Notably, Germany saw robust export share gains during the same period in many industry clusters, including some of its largest. Outlook of managers. While the data are troubling, even more worrisome is the picture painted by managers on the front lines of international competition. **We recently surveyed nearly 10,000 Harvard Business School alumni** to assess the trajectory of the U.S. along the two dimensions that define competitiveness: the ability of U.S.-based firms to compete successfully in the global marketplace and the ability of firms in the U.S. to support high and rising living standards in America. The vast majority of respondents**, 71%, foresaw a decline in U.S. competitiveness in the coming years.** Respondents also reported that when the U.S. competes with other countries to host business activities, it loses two-thirds of the time. Cracks in the Foundation This erosion reflects troubling trends in many of the factors that underpin U.S. competitiveness. This set of factors, as identified in the work of Michael Porter, Mercedes Delgado, Christian Ketels, and Scott Stern, includes macro and micro components. From a macro perspective**, a competitive nation requires sound monetary and fiscal policies** (such as manageable government debt levels), **strong human development (good health care and K–12 education systems), and effective political institutions** (rule of law and effective law-making bodies). Macro foundations create the potential for long-term productivity, but actual productivity depends on the microeconomic conditions that affect business itself. A **competitive nation exhibits a sound business environment** (including modern transport and communications infrastructure, high-quality research institutions, streamlined regulation, sophisticated local consumers, and effective capital markets) **as well as strong clusters of firms and supporting institutions in particular fields, such as information technology in Silicon Valley and energy in Houston**. Competitive nations develop companies that adopt advanced operating and management practices**. In a large country like the U.S., many of the most important drivers of competitiveness rest at the regional and local levels**, not the national level. Though federal policies surely matter, microeconomic drivers tied to regions—such as roads, universities, pools of talent, and cluster specialization—are crucial. **Assessing the U.S. through this lens, we see significant**

cracks in its economic foundations, with particularly troubling deterioration in macro competitiveness. Problems include levels of government debt not seen since World War II; **health care and primary education systems** whose results are neither world-class nor reflective of the large sums spent on them; **and a polarized and often paralyzed political system** (especially at the federal level) that makes decisions only when facing a crisis. In micro competitiveness, eroding skills in the workplace, inadequate physical infrastructure, and rising regulatory complexity increasingly offset traditional strengths such as innovation and entrepreneurship. Our HBS alumni survey provided an original and timely assessment of overall competitiveness and the strengths and weaknesses of the U.S. The findings were sobering. (See the chart "Evaluating the U.S. Business Environment," in the article "Choosing the United States," HBR March 2012.) Respondents perceived **the United States as already weak and in decline with respect to a range of important factors: the complexity of the national tax code, the effectiveness of its political system, basic education, macroeconomic policies, and regulation.** Some **current American strengths, such as logistics and communications infrastructure and workforce skill levels, were seen as declining**. America's unique strengths in entrepreneurship, higher education, and management quality were intact, but these **strengths must overcome growing weaknesses in many other areas**. Nearly two-thirds of survey respondents said that **the U.S. business environment is falling behind that of emerging economies**, while just 8% said that the U.S. is pulling ahead. Overall, the picture that emerges is an American economy that has some crucial strengths but is weakening, with problems especially visible in macro factors.

No impact to economy

Drezner '14 (Daniel Drezner, IR prof at Tufts, The System Worked: Global Economic Governance during the Great Recession, World Politics, Volume 66. Number 1, January 2014, pp. 123-164)

The final significant outcome addresses **a dog** that **hasn't barked**: the effect of the Great Recession on cross-border conflict and violence. **During the initial stages of the crisis, multiple analysts asserted that the financial crisis would lead states to increase their use of force** as a tool for staying in power.42 They voiced genuine concern that the global economic downturn would lead to an increase in conflict—**whether through** greater internal **repression, diversionary wars, arms races, or a ratcheting up of great power conflict**. Violence in the Middle East, border disputes in the South China Sea, and even the disruptions of the Occupy movement fueled impressions of a surge in global public disorder. **The aggregate data suggest otherwise, however**. The Institute for Economics and Peace has concluded that "**the average level of peacefulness in 2012 is approximately the same as it was in 2007**."43 **Interstate violence** in particular **has declined since the start of the financial crisis, as have military expenditures** in most sampled countries. Other **studies confirm that the Great Recession has not triggered any increase in violent conflict**, as Lotta Themner and Peter Wallensteen conclude: "[T]he pattern is one of relative stability when we consider the trend for the past five years."44 **The** secular **decline in violence that started with the end of the Cold War has not been reversed**. Rogers Brubaker observes that "**the crisis has not** to date **generated the surge in protectionist nationalism or ethnic exclusion that might have been expected**."43

AT: Econ Leadership

Other countries collapse as well- relative power sustained

Recession disproves it affects American interest

Blackwill '9 (Former associate dean of the Kennedy School of Government and Deputy Assistant to the President and Deputy National Security Advisor for Strategic Planning (Robert, RAND, "The Geopolitical Consequences of the World Economic Recession—A Caution", http://www.rand.org/pubs/occasional_papers/2009/RAND_OP275.pdf)

First, the United States, five years from today. **Did the global recession weaken the political will of the United States to,** over the long term, **defend its external interests**? Many analysts are already forecasting a "yes" to this question. As a result of what they see as the international loss of faith in the American market economy model and in U.S. leadership, they assert that Washington's influence in international affairs is bound to recede, indeed is already diminishing. For some, the wish is the father of this thought. But **where is the empirical evidence?** From South Asia, through relations with China and Russia through the Middle East peace process, through dealing with Iran's nuclear ambitions and North Korea's nuclear weaponization and missile activities, through confronting humanitarian crises in Africa and instability in Latin America, **the United States has the unchallenged diplomatic lead**. Who could charge the Obama Administration with diplomatic passivity since taking office? Indeed, one could instead conclude that the current global economic turbulence is causing countries to seek the familiar and to rely more and not less on their American connection. In any event, foreigners (and some **Americans**) often **underestimate the existential resilience of the United States**. In this respect, George Friedman's new book, The Next Hundred Years,14 and his view that the United States will be as dominant a force in the 21st century as it was in the last half of the 20th century, is worth considering. So once again, those who now predict, as they have in every decade since 1945, American decay and withdrawal will be wrong 15— from John Flynn's 1955 The Decline of the American Republic and How to Rebuild It,16 to Paul Kennedy's 1987 The Rise and Fall of Great Powers,17 to Andrew Bacevich's 2008 The Limits of Power: The End of American Exceptionalism,18 to Godfrey Hodgson's 2009 The Myth of American Exceptionalism19 and many dozens of similar books in between. Indeed, the policies of the Obama Administration, for better or worse, are likely to be far more influential and lasting regarding America's longer-term geopolitical power projection than the present economic decline. To sum up regarding the United States and the global economic worsening, former Council on Foreign Relations President Les Gelb, in his new book, Power Rules: How Common Sense Can Rescue American Foreign Policy,20 insists that a nation's power is what it always was—essentially the capacity to get people to do what they don't want to do, by pressure and coercion, using one's resources and position. . . . The world is not flat. . . . The shape of global power is decidedly pyramidal—with the United States alone at the top, a second tier of major countries (China, Japan, India, Russia, the United Kingdom, France, Germany and Brazil), and several tiers descending below. . . . Among all nations, only the United States is a true global power with global reach. Lee Kuan Yew, former Prime Minister of the Republic of Singapore, agrees: "**After the crisis, the US is most likely to remain at the top of every key index of national power for decades**. It will remain the dominant global player for the next few decades. No major issue concerning international peace and stability can be resolved without US leadership, and no country or grouping can yet replace America as the dominant global power."21 The current **global economic crisis will not alter this** reality. And the capitalist market model will continue to dominate international economics, not least because China and India have adopted their own versions of it.

No political structure change

Deudney 99 (Daniel, Asst Prof of Poli Sci at Johns Hopkins, Contested Grounds: Security and Conflict in the New Environmental Politics)

Alterations in the **relative power** of states **are unlikely to lead to war** as readily as the lessons of history suggest because **economic power and military power are not** as **tightly coupled** as in the past. The relative economic **power position of major states** such as Germany and Japan has changed greatly since the end of World War II. But these **changes**, while requiring many complex adjustments in interstate relations, **have not been accompanied by war** or the threat of war. In the contemporary world, **whole industries rise, fall, and relocate, often causing** quite **substantial fluctuations in the economic well-being of regions** and peoples, **without** producing **wars**. There is no reason to believe that changes in relative wealth and power positions caused by the uneven impact of environmental degradation would be different in their effects.

2NC- AT: Manufacturing IL

Alt cause- labor shortages and currency manipulation

Markowitz 12 -- Inc. reporter (Eric, "Exposing the Myths About American Manufacturing," Inc., 2-1-12, www.inc.com/eric-markowitz/exposing-the-great-myths-about-american-manufacturing.html, accessed 10-3-12, mss)

Although the tide may be beginning to turn for local manufacturing, the situation for American manufacturers is still far from ideal. Currently, **there are** two **major problems** that **American manufacturers confront** on a daily basis: **currency manipulation**, and a lack of qualified American workers. Currency manipulation has been around for years. From 2008 to 2010, for example, China had pegged the yuan to the dollar, which kept its value artificially low. It also **made Chinese exports cheap for American companies**, who assemble—not manufacture—their products domestically. On one side, Waddell explains, are large corporations such as Whirlpool that outsource their material manufacturing to China, as well as the banks that invest in these companies. These groups have strong lobbies in Washington, which have prevented any major legislation from passing through. "All of those components are made in China, so anything that makes China less competitive hurts them," he says The other side, of course, are small and medium-sized **manufacturing plants** that **see clients finding cheaper materials overseas**. Legislation—some as recent as October 2011—has been introduced to combat currency manipulation, but politicians have largely stalled on the subject. "The Obama administration keeps talking about how they're going to get tougher on China," Waddell says. "And the Republicans said they're going to get tough on China too. But we'll see of push comes to shove if any are actually willing to get tough on China." The other major problem is a **shortage of talent** for American manufacturers. Plants have become more technologically advanced, and necessitate some vocational school training. Waddell points out that it's becoming more and more difficult to find a pool of workers that are qualified to work around machines—and interested in doing it. It's a point echoed by the The Alliance for American Manufacturing, a non-profit that lobbies for American manufacturing. "We need an educational system that does not **warehouse** kids who want vocational careers," writes executive director Scott Paul. "We need our business schools to teach managers how to "reshore" work rather than follow the race to the bottom."

Not key to the economy

Chapman, 12 -- Tribune editorial board member
(Steve, "Manufacturing an economic myth," Chicago Tribune, 3-18-12, articles.chicagotribune.com/2012-03-18/news/ct-oped-0318-chapman-20120318_1_manufacturing-sector-rick-santorum-products, accessed 10-3-12, mss)

Manufacturing accounts for a **shrinking slice** of the total economy mainly because as we grow wealthier, we spend a smaller portion of our income on physical products, like carsand appliances, and a bigger one on services, from health care to cellphone contracts to restaurant meals. That phenomenon holds across the developed world. It's the result of the free market at work, endlessly shifting resources to accommodate changes in consumer demand. Politicians don't think they should tell Americans to eat at Burger King instead of Chipotle, or buy baseball bats instead of soccer balls. They didn't insist we keep our typewriters when personal computers came along. For the most part, our leaders take it as normal and sensible to defer to consumer demand, rather than try to dictate it. Given that, why do they think they ought to rig the tax code to push consumption dollars from services, which Americans want, to goods, which they don't want quite so much? Why should they divert investment from more popular businesses to less popular ones? That's what the measures offered by Santorum and Obama would do. The point is to ease the tax burden of manufacturers at the expense of other companies, on the superstition that the former are more valuable than the latter. It's hard to see the fairness or the economic logic. When the president unveiled his proposal, Jade West of the National Association of Wholesaler-Distributors complained to The New York Times, "My guys are totally freaked out by manufacturing getting a different tax rate than we do. They're not more important in the economy than retail or distribution or anything else." In fact, manufacturing is bound to be a diminishing share of any advanced economy. Obama and Santorum can fling money into the teeth of that trend. But any time politicians want to resist powerful and beneficial economic forces, bet on the economic forces.

Empirically denied- decade of failure

Hudak, 12 -- Brookings Governance Studies fellow

(John, "Providence for Manufacturing: The Cicilline Plan," 8-14-12, www.brookings.edu/~/media/Research/Files/Papers/2012/8/14%20manufacturing%20hudak/0814_manufacturing%20hudak.pdf, accessed 10-3-12, mss)

The Problem: A Decade of Manufacturing Losses

Between 2001 and 2010, net job creation in the United States was abysmal. The manufacturing sector suffered **staggering** economic losses. Forty-nine states saw a net loss in manufacturing jobs, ranging from 1,390 jobs in Wyoming to 544,365 in California. In total, from 2001-2010, the US lost 4.9 million manufacturing jobs. However, in the aggregate, private sector employment shed "only" 3.3 million jobs, meaning negative job growth during the 2000s occurred wholly because of the tremendous loss in manufacturing. Excluding manufacturing, private sector employment grew by 1.6 million jobs.1 While failures in the financial industry and the housing market drove the 2008-9 recession, the 2000s can be considered a manufacturing-driven jobs recession. As Figure 1 shows, in every year of the 2000s, the manufacturing sector lost jobs, even in the face of net job gains in the overall economy. In fact, in 2001 and 2003, manufacturing was singularly responsible for net job losses.

2NC- AT: Econ !

Impact empirically denied

Barnett '9 (Thomas P.M. Barnett, senior managing director of Enterra Solutions LLC, "The New Rules: Security Remains Stable Amid Financial Crisis," 8/25/2009)

When the global financial crisis struck roughly a year ago, the blogosphere was ablaze with all sorts of scary predictions of, and commentary regarding, ensuing conflict and wars -- a rerun of the Great Depression leading to world war, as it were. Now, as global economic news brightens and recovery -- surprisingly led by China and emerging markets -- is the talk of the day, it's interesting to look back over the past year and realize how **globalization's first truly worldwide recession has had virtually no impact whatsoever on the international security** landscape. **None of the** more than three-dozen **ongoing conflicts** listed by GlobalSecurity.org **can be** clearly **attributed to the** global **recession**. Indeed, the last new entry (civil conflict between Hamas and Fatah in the Palestine) predates the economic crisis by a year, and three quarters of the chronic struggles began in the last century. Ditto for the 15 low-intensity conflicts listed by Wikipedia (where the latest entry is the Mexican "drug war" begun in 2006). Certainly, the Russia-Georgia conflict last August was specifically timed, but by most accounts the opening ceremony of the Beijing Olympics was the most important external trigger (followed by the U.S. presidential campaign) for that sudden spike in an almost two-decade long struggle between Georgia and its two breakaway regions. Looking over the various databases, then, we see a most familiar picture: the usual mix of civil conflicts, insurgencies, and liberation-themed terrorist movements. Besides the recent Russia-Georgia dust-up, the only two potential state-on-state wars (North v. South Korea, Israel v. Iran) are both tied to one side acquiring a nuclear weapon capacity -- a process wholly unrelated to global economic trends. And with the United States effectively tied down by its two ongoing major interventions (Iraq and Afghanistan-bleeding-into-Pakistan), our involvement elsewhere around the planet has been quite modest, both leading up to and following the onset of the economic crisis: e.g., the usual counter-drug efforts in Latin America, the usual military exercises with allies across Asia, mixing it up with pirates off Somalia's coast). Everywhere else we find serious instability we pretty much let it burn, occasionally pressing the Chinese -- unsuccessfully -- to do something. Our new Africa Command, for example, hasn't led us to anything beyond advising and training local forces. So, to sum up: * No significant uptick in mass violence or unrest (remember the smattering of urban riots last year in places like Greece, Moldova and Latvia?); * The usual frequency maintained in civil conflicts (in all the usual places); * Not a single state-on-state war directly caused (and no great-power-on-great-power crises even triggered); * **No** great improvement or **disruption in great-power cooperation** regarding the emergence of new nuclear powers (despite all that diplomacy); * A modest scaling back of international policing efforts by the system's acknowledged Leviathan power (inevitable given the strain); and * No serious efforts by any rising great power to challenge that Leviathan or supplant its role. (The worst things we can cite are Moscow's occasional deployments of strategic assets to the Western hemisphere and its weak efforts to outbid the United States on basing rights in Kyrgyzstan; but the best include China and India stepping up their aid and investments in Afghanistan and Iraq.) Sure, we've finally seen global defense spending surpass the previous world record set in the late 1980s, but even that is likely to wane given the stress on public budgets created by all this unprecedented "stimulus" spending. If anything, the **friendly cooperation** on such stimulus packaging **was the most notable** great-power **dynamic** caused by the crisis. Can we say that the world has suffered a distinct shift to political radicalism as a result of the economic crisis? Indeed, no. The world's major **economies remain governed by center**-left or center-right political **factions that remain decidedly friendly to both markets and trade. In the short run, there were attempts across the board to insulate economies from immediate damage (in effect, as much protectionism as allowed under current trade rules), but there was no great slide into "trade wars." Instead, the World Trade Organization is functioning as it was designed to function, and regional efforts toward free-trade agreements have not slowed.** Can we say Islamic radicalism was inflamed by the economic crisis? If it was, that shift was clearly overwhelmed by the Islamic world's growing disenchantment with the brutality displayed by violent extremist groups such as al-Qaida. And looking forward, austere economic times are just as likely to breed connecting evangelicalism as disconnecting fundamentalism. At the end of the day, the economic crisis did not prove to be sufficiently frightening to provoke major economies into establishing global regulatory schemes, even as it has sparked a spirited -- and much needed, as I argued last week -- discussion of the continuing viability of the U.S. dollar as the world's primary reserve currency. Naturally, plenty of experts and pundits have attached great significance to this debate, seeing in it the beginning of "economic warfare" and the like between "fading" America and "rising" China. And yet, in a world of globally integrated production chains and interconnected financial markets, such "diverging interests" hardly constitute signposts for wars up ahead. Frankly, I don't welcome a world in which America's fiscal profligacy goes undisciplined, so bring it on -- please! Add it all up and it's fair to say that this global financial crisis has proven the great resilience of America's post-World War II international liberal trade order.

Desal

1NC – De-Sal

Status quo solves and nuclear desalination is ineffective

Gar **Smith 11**, Editor Emeritus of Earth Island Journal, a former editor of Common Ground magazine, a Project Censored Award-winning journalist, and co-founder of Environmentalists Against War, "NUCLEAR ROULETTE: THE CASE AGAINST A NUCLEAR RENAISSANCE," June, International Forum on Globalization series focused on False Solutions, http://ifg.org/pdf/Nuclear_Roulette_book.pdf

By 2025, 3.5 billion people will face severe fresh-water shortages. **Nuclear proponents** groping for justifications to expand nuclear power **have argued that the waste heat from power plants can provide a "cheap and clean" solution to the inherently costly process of removing salt from seawater**. **Desalination plants** (there are 13,080 worldwide, mostly oil- and gas-fired and mostly in wealthy desert nations) **already produce more than 12 billion gallons of drinkable water a day**. 153 The first nuclear desalinator was installed in Japan in the late 1970s and scores of reactor-heated desalination plants are operating around the world today.¶ But **nuclear desalination is another False Solution**. The problem with atomic water-purifiers is that using heat to treat seawater is an obsolete 20 th -century technology. **Thermal desalination has given way to new reverse osmosis systems that are less energy intensive and 33 times cheaper to operate**. 154 Nuclear desalination advocates claim that wind, solar, and wave power aren't up to the task while new low-temperature evaporation technology may be able to produce high purity water at temperatures as low as 122° Fahrenheit. 155 **Promoting reactors as a solution to the world's water shortage is especially ludicrous since nuclear power plants consume more water than any other energy source**. 156¶ Even proponents admit **there is a potential risk that running seawater through a radioactive environment might contaminate the drinking water produced**. 157 Undeterred, scientists in Russia and India have proposed anchoring small atom-powered water-plants offshore near densely populated coastal cities. But this would provide no relief for the billions of people living inland in water-starved regions of North Africa and Asia.¶ **Desalination is merely a way of giving a marginal new purpose to existing reactors whose balance sheets would be improved if they were retrofitted with desalination chambers**. As with power generation, so with desalination: efficiency in water use (better irrigation technology, crop selection, eliminating transit losses, etc.) beats new production.¶ **A real solution to the growing global water shortage needs to address the increasing amount of water diverted to wasteful agricultural and industrial practices and concentrate on preventing the water from being contaminated in the first place**—by, among other things, capping the size of local populations to match locally available water supplies.

Desalination can't solve – too expensive to ship water to the places that need it most

Increasing Population, 1-22-**2010**, "Fresh Water," http://increasingpopulation.blogspot.com/2010/01/fresh-water.html

Fresh water can be obtained from salt water by desalination. For example, Malta derives two thirds of its freshwater by desalination. A number of nuclear powered desalination plants exist, and physicists agree that there are billions of years of nuclear fuel available. But the **high costs of desalination, especially for poor countries, make impractical the transport of large amounts of desalinated seawater to interiors of large countries**. The cost of desalinization varies; Israel is now desalinating water for a cost of 53 cents per cubic meter, Singapore at 49 cents per cubic meter. In the United States, the cost is 81 cents per cubic meter ($3.06 for 1,000 gallons). According to a 2004 study by Zhoua and Tolb, "one needs to lift the water by 2000 m, or transport it over more than 1600 km to get transport costs equal to the desalination costs. **Desalinated water is expensive in places that are both somewhat far from the sea and somewhat high**, such as Riyadh and Harare. In other places, the dominant cost is desalination, not transport. This leads to somewhat lower costs in places like Beijing, Bangkok, Zaragoza, Phoenix, and, of course, coastal cities like Tripoli." Thus while the study is generally positive about the technology for affluent areas that are proximate to oceans, it concludes that "**Desalinated water may be a solution for some water-stress regions, but not for places that are poor, deep in the interior of a continent, or at high elevation. Unfortunately, that includes** some of **the places with biggest water problems**." Another potential problem with desalination is the byproduction of saline brine, which can be a major cause of marine pollution when dumped back into the oceans at high temperatures."

The global desalination market is set to grow by 320% – extensive market data proves the plan isn't key

SBI Energy '11 [SBI Energy, a division of MarketResearch.com, publishes research reports in the industrial, energy, building/construction, and automotive/transportation markets, "Global Desalination

Market will Grow 320.3% by 2020, Driven by Reverse Osmosis," August 23, http://www.sbireports.com/about/release.asp?id=2267]

Depleting water supplies, coupled with increasing water demand, are driving the global market for desalination technology, which is expected to reach $52.4 billion by 2020, up 320.3% from $12.5 billion in 2010. According to a recent report from energy research publisher SBI Energy, membrane technology reverse osmosis will see the largest growth, reaching $39.46 billion by 2020. The increasing world population, which is estimated to reach 7.52 billion by 2020, up from 6.85 billion in 2010, is depleting a limited fresh water supply with agricultural demands and urbanization leading to more water consumption per person across the globe. According to the report, industrialization is spreading advanced water extraction technology, which is quickly diminishing water resources. "Economic and population growth are the largest drivers for desalination technology," said Shelly Carr, publisher of SBI Energy. "The explosive growth of this market is due to a solution-based alternative to the diminishing supply of the world's most important resource." Desalination technology involves extracting salt and other unwanted minerals from saltwater or brackish water in order to produce fresh water. There are two types of technologies: thermal which relies on heat, and membrane which utilizes semi-permeable membranes to separate salt from seawater and brackish water. According to the report, the cost of desalination is highly influenced by the amount of energy consumed, causing energy efficient membrane technologies, specifically reverse osmosis, to be the most viable option. "The lower operating costs of membrane technologies, which include reverse osmosis, microfiltration, ultrafiltration and nanofiltration, make them a more attractive option," notes Carr. "This segment will grow significantly more than its thermal counterpart." SBI Energy's report, World Desalination Components and Technologies, provides segmented market data for desalination technologies, exhibiting where the growth will occur through 2020. It profiles fifteen major companies, examines major projects and positions of specific countries, and analyzes trends and growth drivers. It is available at: http://www.sbireports.com/redirect.asp?progid=82216&productid=6281776.

No water wars

Barnaby '9 (Wendy, editor of People & Science, the magazine published by the British Science Association, "Do nations go to war over water?," March 19th, http://www.nature.com/nature/journal/v458/n7236/full/458282a.html)

The United Nations warned as recently as last week that climate change harbours the potential for serious conflicts over water. In its World Water Development Report1 of March 2009, it quotes UN Secretary-General Ban Ki-moon noting the risk of water scarcity "transforming peaceful competition into violence". It is statements such as this that gave birth to popular notions of 'water wars'. It is time we dispelled this myth. **Countries do not go to war over water, they solve their water shortages through trade and international agreements**. **Cooperation**, in fact, **is the dominant response to shared water resources. There are 263 cross-boundary waterways in the world. Between 1948 and 1999, cooperation over water, including the signing of treaties, far outweighed conflict over water and violent conflict in particular**. **Of 1,831 instances of interactions over international freshwater resources tallied over that time period** (including everything from unofficial verbal exchanges to economic agreements or military action), **67% were cooperative, only 28% were conflictive,** and the remaining 5% were neutral or insignificant. **In** those **five decades, there were no formal declarations of war over water**.

Their ev is bad scholarship

Barnaby '9 (Wendy, editor of People & Science, the magazine published by the British Science Association, "Do nations go to war over water?," March 19th, http://www.nature.com/nature/journal/v458/n7236/full/458282a.html)

Yet the myth of water wars persists. Climate change, we are told, will cause water shortages. The Intergovernmental Panel on Climate Change estimates that up to 2 billion people may be at risk from increasing water stress by the 2050s, and that this number could rise to 3.2 billion by the 2080s7. Water management will need to adapt. But the mechanisms of trade, international agreements and economic development that

currently ease water shortages will persist. Researchers, such as Aaron Wolf at Oregon State University, Corvallis, and Nils Petter Gleditsch at the International Peace Research Institute in Oslo, point out that **predictions of armed conflict come from the media and from popular, non-peer-reviewed work.** There is something other than water for which shortages, or even the perceived threat of future shortages, does cause war — oil. But the strategic significance of oil is immeasurably higher than that of water. Serious interruptions of oil supplies would stop highly developed economies in their tracks. Oil is necessary for a developed economy, and a developed economy provides for all the needs of its citizens, including water. People in developed economies do not die of thirst. My encounter with Allan's work killed my book. I offered to revise its thesis, but my publishers pointed out that **predicting an absence of war over water would not sell.**

2NC – De-Sal – Inevitable

Desalination inevitable – aff not key

Earth Talk, **2012**, "Can Ocean Desalination Solve the World's Water Shortage?"
http://environment.about.com/od/biodiversityconservation/a/desalination.htm

Despite such arguments, **the practice is becoming more common**. Ted Levin of the Natural Resources Defense Council says that **more than 12,000 desalination plants already supply fresh water in 120 nations, mostly in the Middle East** and Caribbean. And **analysts expect the worldwide market for desalinated water to grow significantly over the coming decades**. Environmental advocates may just have to settle for pushing to "green" the practice as much as possible in lieu of eliminating it altogether.

Hydrogen

1NC- Hydrogen Military

NEG Zero chance of hydrogen-based military fuels being viable for decades

James T. **Bartis 11**, senior policy researcher at the RAND Corporation, and Lawrence Van Bibber, researcher, RAND Corporation, 2011, "Alternative Fuels for Military Applications," http://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG969.pdf

Nuclear, solar, and wind energy technologies may offer important benefits in the production of military, as well as civilian, alternative fuels. Nuclear, wind, and solar energy offer electric power without emitting appreciable amounts of greenhouse gases. For the near- and mid-term alternative fuel options (i.e., hydrotreated oil from animal fats and vegetable oils, and FT liquids), electric power is not an important input to the production process. Electric power, however, can be used to produce hydrogen via electrolysis of water, and hydrogen is an important input. For example, hydrogen produced from nuclear or renewable power can be used to hydrotreat renewable oils produced from seed crops. If sufficient hydrogen is available, nearly all of the carbon in the coal or biomass feedstock to a Fischer-Tropsch plant would end up in the fuel products and not in the air, eliminating the need to capture and sequester carbon dioxide. In addition, the use of hydrogen in an FT plant could nearly triple yields of liquid fuels. For hydrotreated oil from algae, a longer-term option, climate-friendly sources of electric power could be used directly in the processes of cultivating the algae and extracting the oil, because electricity is required for mixing, circulation, and management of water and nutrients. But the beneficial hydrogen derived from nuclear, solar, and wind energy technologies **is not an economically viable option** over the near- to **mid-term**. The trade-off is cost: Producing hydrogen from clean sources in capacities large enough to gain the benefits described above requires **very large amounts** of generating capacity and would **significantly increase** the costs of producing liquid fuels. Considering the importance of reducing greenhouse gas emissions during the process of generating electric power for traditional uses, investments in climate-friendly power generation are already likely to be very high over the coming decades. In this context, the additional investment required to construct large amounts of generating capacity dedicated to producing alternative fuels is probably **not feasible**. **For at least the next two decades, it is highly unlikely that hydrogen from nuclear** or renewable electric-generating technologies **will be a commercially viable option for producing alternative fuels**.

Alt causes to hydrogen – R&D needed

IAEA 12 (International Atomic Energy Agency, "Advances in Nuclear Power Process Heat Applications," http://www-pub.iaea.org/MTCD/Publications/PDF/TE_1682_web.pdf)

Further work must be done on hydrogen production by **water splitting** in the area of pilot scale demonstration to **develop an integrated cycle** with automated control of operation **including stability** of the process, **instrumentation and control required** for the system, and the enhancement of the efficiencies of the processes. • Separation and purification methods must be improved to obtain better quality (purity) of produced hydrogen.

Hydrogen won't spill over – won't commercialize

Nared 12 (North American Renewable Energy Directory, "Hydrogen Economy," http://nared.org/synthetics/hydrogen-economy/)

Hydrogen has one of the widest explosive/ignition mix range with air of all the gases with few exceptions such as acetylene, silane, and ethylene oxide. That means that whatever the mix proportion between air and hydrogen, a hydrogen leak will most likely lead to an explosion, not a mere flame, when a flame or spark ignites the mixture. This makes the use of hydrogen particularly dangerous in enclosed areas such as tunnels or underground parking. Pure hydrogen-oxygen flames burn in the ultraviolet color range and are nearly invisible to the naked eye, so a flame detector is needed to detect if a hydrogen leak is burning. Hydrogen is odorless and leaks cannot be detected by smell. Hydrogen codes and standards are codes and standards for hydrogen fuel cell vehicles, stationary fuel cell applications and portable fuel cell applications. There are codes and standards for the safe handling and storage of hydrogen, for example the Standard for the installation of stationary fuel cell power systems from the National Fire Protection Association. Codes and standards have **repeatedly been identified** as a **major institutional barrier to deploying hydrogen technologies and developing a**

hydrogen economy. To **enable the commercialization** of hydrogen in consumer products, new model building codes and equipment and other technical standards are developed and recognized by federal, state, and local governments.

AT: Hydrogen K2 Hegemony

Zero chance of supply constraints affecting the military – and fuel-switching doesn't solve

Daniel **Sarewitz 12**, Co-Director, Consortium for Science, Policy and Outcomes, Arizona State University; and Samuel Thernstrom Senior Climate Policy Advisor, Clean Air Task Force, March 2012, "Energy Innovation at the Department of Defense: Assessing the Opportunities," http://bipartisanpolicy.org/sites/default/files/Energy%20Innovation%20at%20DoD.pdf

Even so, given adequate forward planning, DoD has **little reason to fear constraints** on supply of petroleum-based fuels **for several decades**, perhaps many. A tightening international oil market, resulting in continuing price increases, would pose greater difficulties for other segments of the U.S. economy and society, and for other countries. DoD's expenditures on fuel may seem large, but should be viewed in the context of other routine expenditures. Even for the Air Force, the principal consumer with its fleet of nearly 6,000 planes, fuel accounts for only around one-fifth of operations and maintenance costs. 12 In Afghanistan and Iraq, fuel and water have made up 70 percent (by weight) of the supplies delivered to forward areas. 13 Transport convoys have drawn frequent and deadly attacks, but the only way to reduce risks, casualties, and delivery costs is to **cut consumption** (of water as well as fuel)—**not something that alternative fuels can promise**. Alternative fuels might have somewhat lower energy densities than petroleum (less energy content per gallon or per pound), meaning somewhat more fuel would have to be burned for the same power output, but not higher (by any significant amount). Indeed, **alternative fuels cannot promise performance advantages of any sort.**

No military fuel cutoffs and costs won't undermine power projection

John **Alic 12**, directed studies on international competitiveness and technology policy at the Congressional Office of Technology Assessment, adjunct at the Johns Hopkins School of Advanced International Studies, March 2012, "Defense Department Energy Innovation: Three Cases," in Energy Innovation at the Department of Defense: Assessing the Opportunities, http://bipartisanpolicy.org/sites/default/files/Energy%20Innovation%20at%20DoD.pdf

Over 80 percent of the petroleum purchased and consumed by the U.S. military consists of jet fuel designated JP-5 or JP-8; diesel fuel makes up nearly all the rest. 46 By volume, recent purchases peaked in fiscal 2003 with the invasion of Iraq, then declined even as rising oil prices pushed expenditures upward: fuel doubled as a share of DoD outlays, from 1.5 percent to 3 percent, between fiscal years 2004 and 2008. Consumption did not change much, but purchases rose from $7 billion (2004) to $18 billion (2008). Prices then fell back somewhat, but in 2011 DoD paid more for jet fuel just as motorists did for gasoline. Even so, the Energy Information Administration (EIA, part of the Energy Department) predicts relatively flat oil prices over the next quarter century, with inflation-adjusted prices in the range of $120 per barrel.47 Oil prices respond almost instantaneously to international political events (e.g., the threat of supply constrictions) and to economic fluctuations affecting demand. A small number of big suppliers—state-owned or state-controlled enterprises inside and outside the Organization of Petroleum Exporting Countries (OPEC), plus a handful of private multinationals—dominate production. In recent years, most have appeared to pump oil at or near capacity most of the time. By most indications, Saudi Arabia alone retains the ability to affect prices by raising or lowering output. Otherwise suppliers must act together to set prices, and in recent years that has come to seem mostly a theoretical possibility. **Periodic fears** of disruption linked with political unrest or war have had greater effects, and sharp swings in prices have been **common**, affected also by asynchronous demand variations in major markets. Price increases have been moderated by declining energy intensity (energy consumption relative to economic output) in most parts of the world. This is the principal reason EIA does not expect the long-term trend to be sharply upward. Acknowledging the more dramatic scenarios some analysts put forward, there seems **little** in what is actually known about world oil reserves and the workings of the international market to suggest that the **U.S. military faces either intolerably burdensome fuel costs or supply risks in the foreseeable future**. DoD buys fuel alongside other purchasers. It is a big customer, but not big enough to affect prices. Long-distance transport of crude oil and refined products is **routine and inexpensive**. So long as the world market remains effectively integrated, it would take a massive injection of substitutable alternatives to affect prices. Private investors, absent proven capability to produce alternatives in substantial quantities at competitive costs—or a package of subsidies such as those for domestic ethanol, perhaps including binding price guarantees—will find little reason to increase production capacity rapidly. Fuel is fuel, and as output of substitutable alternatives builds it will simply flow into the international market at

prices little different from those for other refined petroleum products. Given U.S. dependence on imported oil, it is reliability of supply, rather than pricing, that might seem the larger issue. But again, the market is international; indeed, **DoD buys much of its fuel abroad**—in recent years, something like half (box 2.3). Innovations—perhaps sustainable biofuels—would, once proven, migrate to the lowest-cost-production locations, many of them presumably overseas. (The United States has no monopoly on sunshine and arable land.) DoD and the government might support innovation and subsidize production, but it would be difficult to wall off domestic output without some compelling national security rationale. Wartime supply interruptions might be accepted as justifying government ownership and reservation of output for the military, but not indefinite fears of future interruptions. Private ownership coupled with domestic production and export restrictions would more than likely be seen as contravening bedrock principles of U.S. foreign economic policy, which since World War II has been based on borders nominally open to trade.

Even if supply disruption happened we'd never let it affect heg, and other countries would be hit worse

John **Alic 12**, directed studies on international competitiveness and technology policy at the Congressional Office of Technology Assessment, adjunct at the Johns Hopkins School of Advanced International Studies, March 2012, "Defense Department Energy Innovation: Three Cases," in Energy Innovation at the Department of Defense: Assessing the Opportunities, http://bipartisanpolicy.org/sites/default/files/Energy%20Innovation%20at%20DoD.pdf

In any event, should **serious bottlenecks** in fuel supplies appear, the United States will be **less vulnerable** than many other countries, including major allies. The U.S. government can expect to **outbid** competing customers, beginning with poor countries totally dependent on imported oil and including wealthy economies such as Japan that benefit from the U.S. security umbrella. So long as there is fuel to buy (or commandeer, in war), **DoD will be better able to afford it than almost any other customer**. The armed forces have first claim on the Strategic Petroleum Reserve. **Household consumers and airlines have more to fear from supply constrictions and price rises than DoD**.

NEG Zero chance of hydrogen-based military fuels being viable for decades

James T. **Bartis 11**, senior policy researcher at the RAND Corporation, and Lawrence Van Bibber, researcher, RAND Corporation, 2011, "Alternative Fuels for Military Applications," http://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG969.pdf

Nuclear, solar, and wind energy technologies may offer important benefits in the production of military, as well as civilian, alternative fuels. Nuclear, wind, and solar energy offer electric power without emitting appreciable amounts of greenhouse gases. For the near- and mid-term alternative fuel options (i.e., hydrotreated oil from animal fats and vegetable oils, and FT liquids), electric power is not an important input to the production process. Electric power, however, can be used to produce hydrogen via electrolysis of water, and hydrogen is an important input. For example, hydrogen produced from nuclear or renewable power can be used to hydrotreat renewable oils produced from seed crops. If sufficient hydrogen is available, nearly all of the carbon in the coal or biomass feedstock to a Fischer-Tropsch plant would end up in the fuel products and not in the air, eliminating the need to capture and sequester carbon dioxide. In addition, the use of hydrogen in an FT plant could nearly triple yields of liquid fuels. For hydrotreated oil from algae, a longer-term option, climate-friendly sources of electric power could be used directly in the processes of cultivating the algae and extracting the oil, because electricity is required for mixing, circulation, and management of water and nutrients. But the beneficial hydrogen derived from nuclear, solar, and wind energy technologies is **not an economically viable option** over the near- to **mid-term**. The trade-off is cost: Producing hydrogen from clean sources in capacities large enough to gain the benefits described above requires **very large amounts** of generating capacity and would **significantly increase** the costs of producing liquid fuels. Considering the importance of reducing greenhouse gas emissions during the process of generating electric power for traditional uses, investments in climate-friendly power generation are already likely to be very high over the coming decades. In this context, the additional investment required to construct large amounts of generating capacity dedicated to producing alternative fuels is probably **not feasible**. **For at least the next two decades, it is highly unlikely that hydrogen from nuclear** or renewable electric-generating technologies **will be a commercially viable option for producing alternative fuels**.

Proliferation

1NC- Proliferation

The squo is reverse proliferating- no impact

Kahl et. al 13 (Colin H., Senior Fellow at the Center for a New American Security and an associate professor in the Security Studies Program at Georgetown University's Edmund A. Walsh School of Foreign Service, Melissa G. Dalton, Visiting Fellow at the Center for a New American Security, Matthew Irvine, Research Associate at the Center for a New American Security, February, "If Iran Builds the Bomb, Will Saudi Arabia Be Next?" http://www.cnas.org/files/documents/publications/CNAS_AtomicKingdom_Kahl.pdf, 2013)
cites Jacques Hymans, USC Associate Professor of IR

I I I . LESSONS FRO M HISTOR Y Concerns over "regional proliferation chains," "falling nuclear dominos" and "nuclear tipping points" are nothing new; indeed, reactive proliferation fears date back to the dawn of the nuclear age.14 Warnings of an inevitable deluge of proliferation were commonplace from the 1950s to the 1970s, resurfaced during the discussion of "rogue states" in the 1990s and became even more ominous after 9/11.15 In 2004, for example, Mitchell Reiss warned that "in ways both fast and slow, we may very soon be approaching a nuclear 'tipping point,' where many countries may decide to acquire nuclear arsenals on short notice, thereby triggering a proliferation epidemic." Given the presumed fragility of the nuclear nonproliferation regime and the ready supply of nuclear expertise, technology and material, Reiss argued, "a single new entrant into the nuclear club could catalyze similar responses by others in the region, with the Middle East and Northeast Asia the most likely candidates."16 Nevertheless, **predictions of** inevitable **prolif**eration **cascades have historically proven false** (see The Proliferation Cascade Myth text box). In the six decades since atomic weapons were first developed, nuclear restraint has proven far more common than nuclear proliferation, and cases of reactive proliferation have been exceedingly rare. Moreover, most **countries that** have **started down the nuclear path** have **found the road more difficult than imagined,** both technologically and bureaucratically, **leading the majority** of nuclear-weapons aspirants **to reverse course.** Thus, despite frequent warnings of an unstoppable "nuclear express,"17 William Potter and Gaukhar Mukhatzhanova astutely note that the "train to date has been slow to pick up steam, has made fewer stops than anticipated, and usually has arrived much later than expected."18 None of this means that additional proliferation in response to Iran's nuclear ambitions is inconceivable, but the empirical record does suggest that regional chain reactions are not inevitable. Instead, only certain countries are candidates for reactive proliferation. Determining the risk that any given country in the Middle East will proliferate in response to Iranian nuclearization requires an assessment of the incentives and disincentives for acquiring a nuclear deterrent, the technical and bureaucratic constraints and the available strategic alternatives. Incentives and Disincentives to Proliferate Security considerations, status and reputational concerns and the prospect of sanctions combine to shape the incentives and disincentives for states to pursue nuclear weapons. **Analysts predicting proliferation** cascades tend to **emphasize the incentives for** reactive **prolif**eration **while** ignoring or **downplaying the disincentives. Yet**, as it turns out, **instances of** nuclear **prolif**eration (including reactive proliferation) **have been so rare because** going down **this road** often **risks insecurity, reputational damage and economic costs that outweigh** the **potential benefits.**19 Security and regime survival are especially important motivations driving state decisions to proliferate. All else being equal, if a state's leadership believes that a nuclear deterrent is required to address an acute security challenge, proliferation is more likely.20 Countries in conflict-

prone neighborhoods facing an "enduring rival"– especially countries with inferior conventional military capabilities vis-à-vis their opponents or those that face an adversary that possesses or is seeking nuclear weapons – may be particularly prone to seeking a nuclear deterrent to avert aggression.21 A recent quantitative study by Philipp Bleek, for example, found that security threats, as measured by the frequency and intensity of conventional militarized disputes, were highly correlated with decisions to launch nuclear weapons programs and eventually acquire the bomb.22 The Proliferation Cascade Myth Despite repeated warnings since the dawn of the nuclear age of an inevitable deluge of nuclear proliferation, such fears have thus far proven largely unfounded. Historically, nuclear restraint is the rule, not the exception – and the degree of restraint has actually increased over time. In the first two decades of the nuclear age, five nuclear-weapons states emerged: the United States (1945), the Soviet Union (1949), the United Kingdom (1952), France (1960) and China (1964). However, in the nearly 50 years since China developed nuclear weapons, only four additional countries have entered (and remained in) the nuclear club: Israel (allegedly in 1967), India ("peaceful" nuclear test in 1974, acquisition in late-1980s, test in 1998), Pakistan (acquisition in late-1980s, test in 1998) and North Korea (test in 2006).23 This significant slowdown in the pace of proliferation occurred despite the widespread dissemination of nuclear know-how and the fact that the number of states with the technical and industrial capability to pursue nuclear weapons programs has significantly increased over time.24 Moreover, in the past 20 years, several states have either given up their nuclear weapons (South Africa and the Soviet successor states Belarus, Kazakhstan and Ukraine) or ended their highly developed nuclear weapons programs (e.g., Argentina, Brazil and Libya).25 Indeed, by one estimate, 37 countries have pursued nuclear programs with possible weaponsrelated dimensions since 1945, yet the overwhelming number chose to abandon these activities before they produced a bomb. Over time, **the number of nuclear reversals has grown while the number of states initiating programs** with possible military dimensions **has** markedly **declined**.26 Furthermore – especially since the Nuclear Non-Proliferation Treaty (NPT) went into force in 1970 – reactive proliferation has been exceedingly rare. The NPT has near-universal membership among the community of nations; only India, Israel, Pakistan and North Korea currently stand outside the treaty. Yet the actual and suspected acquisition of nuclear weapons by these outliers has not triggered widespread reactive proliferation in their respective neighborhoods. Pakistan followed India into the nuclear club, and the two have engaged in a vigorous arms race, but Pakistani nuclearization did not spark additional South Asian states to acquire nuclear weapons. Similarly, the North Korean bomb did not lead South Korea, Japan or other regional states to follow suit.27 In the Middle East, no country has successfully built a nuclear weapon in the four decades since Israel allegedly built its first nuclear weapons. Egypt took initial steps toward nuclearization in the 1950s and then expanded these efforts in the late 1960s and 1970s in response to Israel's presumed capabilities. However, Cairo then ratified the NPT in 1981 and abandoned its program.28 Libya, Iraq and Iran all pursued nuclear weapons capabilities, but only Iran's program persists and none of these states initiated their efforts primarily as a defensive response to Israel's presumed arsenal.29 Sometime in the 2000s, Syria also appears to have initiated nuclear activities with possible military dimensions, including construction of a covert nuclear reactor near al-Kibar, likely enabled by North Korean assistance.30 (An Israeli airstrike destroyed the facility in 2007.31) The motivations for Syria's activities remain murky, but the nearly 40-year lag between Israel's alleged development of the bomb and Syria's actions suggests that reactive proliferation was not the most likely cause. Finally, even countries that start on the nuclear path have found it very difficult, and exceedingly time consuming, to reach the end. Of the 10 countries that launched nuclear weapons projects after 1970, only three (Pakistan, North Korea and South Africa) succeeded; one (Iran) remains in progress, and the rest failed or were reversed.32 The successful projects have also generally needed much more time than expected to finish. According to Jacques Hymans, **the average time required to complete a** nuclear weapons **program has increased from seven**

years prior to 1970 **to** about **17 years** after 1970, **even as the hardware, knowledge and industrial base required for prolif**eration **has expanded** to more and more countries.33 Yet throughout the nuclear age, many states with potential security incentives to develop nuclear weapons have nevertheless abstained from doing so.34 Moreover, contrary to common expectations, recent statistical research shows that states with an enduring rival that possesses or is pursuing nuclear weapons are not more likely than other states to launch nuclear weapons programs or go all the way to acquiring the bomb, although they do seem more likely to explore nuclear weapons options.35 This suggests that a rival's acquisition of nuclear weapons does not inevitably drive proliferation decisions. One reason that reactive proliferation is not an automatic response to a rival's acquisition of nuclear arms is the fact that security calculations can cut in both directions. Nuclear weapons might deter outside threats, but **leaders have to weigh** these **potential gains against the possibility that seeking nuclear weapons would** make the country or regime less secure by **trigger**ing **a regional arms race or** a preventive **attack by outside powers.** Countries also have to consider the possibility that **pursuing nuclear weapons will** produce **strain**s in strategic **relations**hips **with** key **allies** and security patrons. If a state's leaders conclude that their overall security would decrease by building a bomb, they are not likely to do so.36 Moreover, although security considerations are often central, they are rarely sufficient to motivate states to develop nuclear weapons. Scholars have noted the importance of other factors, most notably the perceived effects of nuclear weapons on a country's relative status and influence.37 Empirically, the most highly motivated states seem to be those with leaders that simultaneously believe a nuclear deterrent is essential to counter an existential threat and view nuclear weapons as crucial for maintaining or enhancing their international status and influence. Leaders that see their country as naturally at odds with, and naturally equal or superior to, a threatening external foe appear to be especially prone to pursuing nuclear weapons.38 Thus, as Jacques Hymans argues, extreme levels of fear and pride often "combine to produce a very strong tendency to reach for the bomb."39 Yet here too, leaders contemplating acquiring nuclear weapons have to balance the possible increase to their prestige and influence against the normative and reputational costs associated with violating the Nuclear Non-Proliferation Treaty (NPT). If a country's leaders fully embrace the principles and norms embodied in the NPT, highly value positive diplomatic relations with Western countries and see membership in the "community of nations" as central to their national interests and identity, they are likely to worry that developing nuclear weapons would damage (rather than bolster) their reputation and influence, and thus they will be less likely to go for the bomb.40 In contrast, countries with regimes or ruling coalitions that embrace an ideology that rejects the Western dominated international order and prioritizes national self-reliance and autonomy from outside interference seem more inclined toward proliferation regardless of whether they are signatories to the NPT.41 Most countries appear to fall in the former category, whereas only a small number of "rogue" states fit the latter. According to one count, before the NPT went into effect, more than 40 percent of states with the economic resources to pursue nuclear programs with potential military applications did so, and very few renounced those programs. Since the inception of the nonproliferation norm in 1970, however, only 15 percent of economically capable states have started such programs, and nearly 70 percent of all states that had engaged in such activities gave them up.42 The prospect of being targeted with economic sanctions by powerful states is also likely to factor into the decisions of would-be proliferators. Although sanctions alone proved insufficient to dissuade Iraq, North Korea and (thus far) Iran from violating their nonproliferation obligations under the NPT, this does not necessarily indicate that sanctions are irrelevant. A potential proliferator's vulnerability to sanctions must be considered. All else being equal, the more vulnerable a state's economy is to external pressure, the less likely it is to pursue nuclear weapons. A comparison of states in East Asia and the Middle East that have pursued nuclear weapons with those that have not done so suggests that countries with economies that are highly integrated into the international economic

system – especially those dominated by ruling coalitions that seek further integration – have historically been less inclined to pursue nuclear weapons than those with inward-oriented economies and ruling coalitions.43 A state's vulnerability to sanctions matters, but so too does the leadership's assessment regarding the probability that outside powers would actually be willing to impose sanctions. Some would-be proliferators can be easily sanctioned because their exclusion from international economic transactions creates few downsides for sanctioning states. In other instances, however, a state may be so vital to outside powers – economically or geopolitically – that it is unlikely to be sanctioned regardless of NPT violations. Technical and Bureaucratic Constraints In addition to motivation to pursue the bomb, a state must have the technical and bureaucratic wherewithal to do so. This capability is partly a function of wealth. Richer and more industrialized states can develop nuclear weapons more easily than poorer and less industrial ones can; although as Pakistan and North Korea demonstrate, cash-strapped states can sometimes succeed in developing nuclear weapons if they are willing to make enormous sacrifices.44 A country's technical know-how and the sophistication of its civilian nuclear program also help determine the ease and speed with which it can potentially pursue the bomb. The existence of uranium deposits and related mining activity, civilian nuclear power plants, nuclear research reactors and laboratories and a large cadre of scientists and engineers trained in relevant areas of chemistry and nuclear physics may give a country some "latent" capability to eventually produce nuclear weapons. Mastery of the fuel-cycle – the ability to enrich uranium or produce, separate and reprocess plutonium – is particularly important because this is the essential pathway whereby states can indigenously produce the fissile material required to make a nuclear explosive device.45 States must also possess the bureaucratic capacity and managerial culture to successfully complete a nuclear weapons program. Hymans convincingly argues that many recent would-be proliferators have weak state institutions that permit, or even encourage, **rulers** to **take a coercive**, authoritarian **management approach to their nuclear programs. This** approach, in turn, politicizes and ultimately **undermines nuclear projects by gutting the autonomy** and professionalism **of the** very **scientists, experts and organizations needed to** successfully **build the bomb.**46 Alternative Sources of Nuclear Deterrence Historically, the availability of credible security guarantees by outside nuclear powers has provided a potential alternative means for acquiring a nuclear deterrent without many of the risks and costs associated with developing an indigenous nuclear weapons capability. As Bruno Tertrais argues, nearly all the states that developed nuclear weapons since 1949 either lacked a strong guarantee from a superpower (India, Pakistan and South Africa) or did not consider the superpower's protection to be credible (China, France, Israel and North Korea). Many other countries known to have pursued nuclear weapons programs also lacked security guarantees (e.g., Argentina, Brazil, Egypt, Indonesia, Iraq, Libya, Switzerland and Yugoslavia) or thought they were unreliable at the time they embarked on their programs (e.g., Taiwan). In contrast, several **potential prolif**eration **candidates** appear to **have abstained from developing the bomb** at least **partly because of** formal or informal **extended deterrence guarantees from the U**nited **S**tates (e.g., Australia, Germany, Japan, Norway, South Korea and Sweden).47 All told, a recent quantitative assessment by Bleek finds that **security assurances have empirically** significantly **reduced prolif**eration proclivity among recipient countries.48 Therefore, if a country perceives that a security guarantee by the United States or another nuclear power is both available and credible, it is less likely to pursue nuclear weapons in reaction to a rival developing them. This option is likely to be particularly attractive to states that lack the indigenous capability to develop nuclear weapons, as well as states that are primarily motivated to acquire a nuclear deterrent by security factors (as opposed to status-related motivations) but are wary of the negative consequences of proliferation.

Sovereignty drives prolif—proves benign tech transfer can't solve—won't assuage want for weapons

Lewis 12 Jeffrey Lewis, director of the East Asia Nonproliferation Program at the James Martin Center for Nonproliferation, 8/1/12, It's Not as Easy as 1-2-3, www.foreignpolicy.com/articles/2012/08/01/it_s_not_as_easy_as_1_2_3?page=full

Creating market incentives to discourage the spread of enrichment and reprocessing seems like a reasonable thing to do - **except that most states make nuclear decisions on something other than a cost basis**. Nuclear power enthusiasts have been no strangers to wishful thinking, starting with claims that nuclear energy would be "too cheap to meter." Government decisions about nuclear power tend to **prioritize** concerns about **sovereignty** and keeping technological pace with neighbors. It is not hard to see national nuclear programs as something akin to national airlines - money-losing prestige projects that barely take market forces into account. Often, aspiring nuclear states look to countries like the United States and Japan as models. If such countries invest heavily in fuel-cycle services, developing states might **try to copy** them **rather than** simply **become** their **customers**.

Supply-side efforts fail miserably—countries will find work arounds

Cleary '12 Richard Cleary, American Enterprise Institute Research Assistant, 8/13/12, Richard Cleary: Persuading Countries to Forgo Nuclear Fuel-Making, npolicy.org/article.php?aid=1192&tid=30

The examples above show the limitations of both demand and supply side efforts. Supply side diplomatic interventions, made before the transfer of technology, have been at times effective, particularly in precluding nuclear fuel-making in the short term and buying time for more lasting solutions. However, as the Pakistan and Brazil cases illustrated, supply side interventions are no substitute for demand side solutions: **Countries face political choices regarding nuclear fuel-making**. **A nation set upon an independent fuel-making capacity**, such as Pakistan or Brazil, **is unlikely to give up efforts because of supply side controls**. Multilateral fuel-making arrangements, as proposed repeatedly by the United States, have not materialized and therefore seem to have had little tangible influence.

They can easily find other countries to provide them with nuclear tech

Hibbs '12 Mark, Carnegie Nuclear Policy Program Senior Associate, 8/7/12, Negotiating Nuclear Cooperation Agreements, carnegieendowment.org/2012/08/07/negotiating-nuclear-cooperation-agreements/d98z

'

U.S. resolve to include a no-ENR pledge in the body of new bilateral agreements will be seen by some countries as arrogant and unacceptable. Incorporating ENR terms into side-letters or preambles may be less offensive. That approach would also more easily facilitate including reciprocal commitments by the United States into its 123 bargains with foreign countries. These might include guaranteeing nuclear fuel supply through participation in the U.S. fuel bank, facilitating the country's access to other back-up sources of nuclear fuel, and, in the future, perhaps even taking back U.S.-origin spent fuel. The outcome of any negotiation for a bilateral nuclear cooperation agreement will depend on the leverage both sides bring to the table. When the United States negotiated most of the 22 such agreements in force today, it was the world's leading provider of nuclear technology, equipment, and fuel. As the examples of Jordan and Vietnam show, unlike half a century ago, nuclear newcomers today **don't need to buy American**. The vendor field is populated by firms in Argentina, Australia, Canada, the European Union, Japan, Kazakhstan, Namibia, Niger, Russia, and South Korea, and in the future they will be joined by others in China and India. Governments in these countries do not seek to establish a no-ENR requirement as a condition for foreign nuclear cooperation. Some of them, Australia and Canada for example, have strong nonproliferation track records. **Countries** now **seeking** to form **foreign industrial partnerships to set up nuclear power** programs **have numerous options and they will favor arrangements that provide them the most freedom and flexibility**.

Plan leads to backlash

NEI '12 Nuclear Energy Institute, June 2012, H.R. 1280: A Misguided Attempt to Control Enrichment and Reprocessing Technologies, http://www.nei.org/resourcesandstats/documentlibrary/newplants/whitepaper/white-paper--hr-1280-a-misguided-attempt-to-control-enrichment-and-reprocessing-technologies

Recent **initiatives to deny E&R technologies** to countries that do not possess them **have provoked strong objections** from nuclear supplier and consumer countries alike. In 2004, NSG members and the broader international community lodged forceful complaints against President Bush's proposal for the NSG to provide fuel assurances only to states that forswear E&R and refrain from transferring E&R technologies to any state that does not possess them. Many **nations consider such efforts discriminatory** and in violation of sovereign rights specifically guaranteed by the Nuclear Non-Proliferation Treaty (NPT) to nonnuclear-weapons states. Uranium producer countries like Australia and Canada have also objected on grounds that they may one day wish to enrich the uranium they produce. The Non-Aligned Movement (NAM), which includes many prospective partners for U.S. nuclear cooperation, has strongly opposed restrictions on E&R in various international fora, including the IAEA Board of Governors and NPT Review Conferences. The final document of the 2010 NPT Review Conference affirmed the inalienable rights of parties to use nuclear energy peacefully "without jeopardizing its policies for international cooperation agreements and arrangements for peaceful uses of nuclear energy and its fuel-cycle choices." The document asserted a legitimate right, particularly among developing countries, to full access to nuclear material, equipment and technology for peaceful purposes. The document called on parties to "eliminate in this regard any undue constraints inconsistent with the Treaty."

US won't exert nonproliferation leadership

Cleary '12 (Richard Cleary, American Enterprise Institute Research Assistant, 8/13/12, Richard Cleary: Persuading Countries to Forgo Nuclear Fuel-Making, npolicy.org/article.php?aid=1192&tid=30)

The cases above offer a common lesson: The U.S., though constrained or empowered by circumstance, can exert considerable sway in nonproliferation matters, **but** often **elects not to apply the most powerful tools at its disposal for fear of jeopardizing other objectives**. The persistent dilemma of how much to emphasize nonproliferation goals, and at what cost, has contributed to cases of **nonproliferation failure**. The inconsistent or incomplete application of U.S. power in nonproliferation cases is most harmful when it gives the impression to a nation that either sharing sensitive technology or developing it is, or will become, acceptable to Washington. **U.S. reticence** historically, with some exceptions, **to prioritize nonproliferation**—and in so doing reduce the chance of success in these cases—**does not leave room for** great **optimism about future U.S. efforts at persuading countries to forgo nuclear fuel-making**.

2NC- Proliferation Defense

No risk of prolif, it wouldn't cause a chain reaction, and it would be slow at worst - your evidence is alarmism

Gavin 10 (Francis, Tom Slick Professor of International Affairs and Director of the Robert S. Strauss Center for International Security and Law @ the Lyndon B. Johnson School of Public Affairs @ the University of Texas at Austin, "Sam As It Ever Was; Nuclear Alarmism, Proliferation, and the Cold War," Lexis)

Fears of a tipping point were especially **acute in** the aftermath of China's **1964** detonation of an atomic bomb: **it was predicted** that **India, Indonesia, and Japan might follow, with** consequences worldwide, as "**Israel, Sweden, Germany, and other** potential nuclear **countries** far from China and India would be affected by proliferation in Asia." 40 A U.S. government document identified "at least eleven nations (India, Japan, Israel, Sweden, West Germany, Italy, Canada, Czechoslovakia, East Germany, Rumania, and Yugoslavia)" with the capacity to go nuclear, a number that would soon "grow substantially" to include "South Africa, the United Arab Republic, Spain, Brazil and Mexico." 41 A top-secret, blue-ribbon committee established to craft the U.S. response contended that "the [1964] Chinese nuclear explosion has increased the urgency and complexity of this problem by creating strong pressures to develop independent nuclear forces, which, in turn, could strongly influence the plans of other potential nuclear powers." 42 **These predictions were largely wrong**. In 1985 the National Intelligence Council noted that for "almost thirty years the Intelligence Community has been writing about which nations might next get the bomb." **All of** these **estimates based** their largely **pessimistic and** ultimately incorrect **estimates on factors such as the increased "access to fissile materials," improved technical capabilities** in countries, **the likelihood of "chain reactions**," or a "scramble" to proliferation when "even one additional state demonstrates a nuclear capability." The 1985 report goes on, "The most striking characteristic of the present-day nuclear proliferation scene is that, despite the alarms rung by past Estimates, no additional overt proliferation of nuclear weapons has actually occurred since China tested its bomb in 1964." **Although "some proliferation** of nuclear explosive capabilities and other major proliferation-related developments **have taken place in the past two decades," they did not have "the damaging, systemwide impacts that the Intelligence community** generally **anticipated** they would." 43 **In his analysis of** more than **sixty years of failed efforts to accurately predict nuclear proliferation**, analyst Moeed **Yusuf concludes** that "**the pace of proliferation has been much slower than anticipated by most**." **The majority of countries suspected of trying to obtain a nuclear weapons capability "never even came close to crossing the threshold**. In fact, **most did not even initiate a weapons program."** If all the countries that were considered prime suspects over the past sixty years had developed nuclear weapons, "the world would have at least 19 nuclear powers today." 44 As Potter and Mukhatzhanova argue, **government and academic experts frequently "exaggerated the scope and pace of** nuclear weapons **proliferation."** 45 **Nor is there compelling evidence** that **a** nuclear proliferation **chain reaction will ever occur**. Rather, **the pool of potential proliferators has been shrinking. Proliferation pressures were far greater during the Cold War. In the 1960s,** at least **twenty-one countries** either had or **were considering nuclear weapons** research programs. **Today only nine countries** are known to **have nuclear weapons**. Belarus, Brazil, Kazakhstan, Libya, South Africa, Sweden, and Ukraine have dismantled their weapons programs. **Even rogue states** that are/were a great concern to U.S. policymakers--Iran, Iraq, Libya, and North Korea--**began their nuclear weapons programs before the Cold War had ended.** 46 As far as is known, **no nation has started a new nuclear weapons program since the demise of the Soviet Union** in **1991**. 47 Ironically, by focusing on the threat of rogue states, policymakers may have underestimated the potentially far more destabilizing effect of proliferation in "respectable" states such as Germany, Japan, South Korea, and Taiwan.

No impact - multiple checks prevent use

Cha 1 (Victor, Associate Professor of Government and School of Foreign Service @ Georgetown, "The second nuclear age: Proliferation pessimism versus sober optimism in South Asia and East Asia," Journal of Strategic Studies, InformaWorld)

Proliferation pessimists do not deny the existence of the nuclear taboo; they do, nevertheless, see this taboo as shared only by First World proliferators. Is this a **fair** assessment? As Tannenwald argues, **a taboo takes effect when the agent realizes** (1) **the exceptionalist nature of the weapon (i.e., in terms of its destructive power)**; (2)

the absence of effective defenses (i.e., vulnerability); (3) **and fears the political and social consequences of taking such an action. All of these conditions readily hold for new nuclear powers**. Moreover, **the revulsion against nuclear weapons use (first-use) has become so institutionalized in an array of international agreements and practices such that new NWS states operate in an environment that severely circumscribes the realm of legitimate nuclear use.**90 **Proliferation pessimists** therefore **underestimate the transformative effects of nuclear weapons on these new proliferators. They assume that the interests for aspiring nuclear powers remain constant in the pre- and post-acquisition phases. They do not consider that once states cross the nuclear threshold, they become acutely aware of the dangers and responsibilities that come with these new awesome capabilities**. The likelihood of such a learning process occurring is even higher if nuclear weapons are valued for their political currency. As noted above, while security needs certainly drive proliferation in Asia, a predominant factor that cannot be disentangled from this dynamic is the striving for prestige and international recognition as an NWS state. Moreover, **if the taboo equates the use of nuclear weapons with an 'uncivilized' or 'barbarian' state," then those states that are status-conscious will be that much more attuned to the taboo. The effects of the taboo on Asian proliferators are therefore both regulative and constitutive**. In the former sense, **as these states further embed themselves in the international community** (discussed below), **this change heightens the costs of breaking any rules regarding nuclear use. The taboo's constitutive effects** also **are evident in that any use would undermine one of the primary purposes for which the capabilities were sought** (e.g., prestige, badge of modernity). Although it is still relatively early in the game, **there is** some **evidence that the acquisition of nuclear capabilities has been accompanied by a change in preferences about what is acceptable behavior.** While **India** has rejected any notions that it might roll back its newfound capability, it had readily admitted that as an incipient nuclear weapons state, it now **has certain responsibilities that include a no-first-use policy and not sharing nuclear weapons technology with other irresponsible states.**92 Similarly, **Pakistan previously placed little value and even resented nonproliferation norms as these were seen as inhibiting and degrading to the national character**.93 Otherwise, they might have been swayed by the benefits of not responding to the Indian tests as a shining example of a country adhering to nuclear nonproliferation norms. Arguably it is only after becoming an incipient nuclear weapons state that such arguments about nonproliferation gain value. Nowhere is this perverse dynamic more evident than in both sides' views of the CTBT. Previously perceived as an instrument intended to preempt nuclear spread beyond the first age, the CTBT is now arguably seen by India and Pakistan in less antagonistic terms, and even among some, as a responsibility to be borne as a nuclear state

Warming

1NC – Warming

SMRs don't solve warming – timeframe and trades off with renewable tech that solves

Arjun **Makhijani 10**, President of the Institute for Energy & Environmental Research, Ph.D. in engineering (specialization: nuclear fusion) from the University of California at Berkeley; and Michele Boyd, former director of the Safe Energy Program at Physicians for Social Responsibility, September 2010, "Small Modular Reactors," http://www.psr.org/nuclear-bailout/resources/small-modular-reactors-no.pdf

Efficiency and most **renewable technologies** are already **cheaper than new large reactors**. The **long time**—a decade or more—that it will take to certify SMRs will do little or **nothing to help with** the global **warming** problem and will actually **complicate** current **efforts underway**. For example, the current schedule for commercializing the above-ground sodium cooled reactor in Japan extends to 2050, making it irrelevant to addressing the climate problem. Relying on assurances that SMRs will be cheap is **contrary to the experience about economies of scale** and is likely to waste time and money, while creating new safety and proliferation risks, as well as new waste disposal problems.

SMR's don't solve warming- way to slow

PR Newswire '10 (PR Newswire, "IEER/PSR: 'Small Modular Reactors' No Panacea for What Ails Nuclear Power", http://www.prnewswire.com/news-releases/ieerpsr-small-modular-reactors-no-panacea-for-what-ails-nuclear-power-104024223.html, September 29, 2010)

And what about SMRs as some kind of "silver bullet" for averting global warming? The IEER/PSR fact sheet points out: "**Efficiency and most renewable technologies are already cheaper than new large reactors. The long time** -- a decade or more -- **that it will take to certify SMRs will do little or nothing to help with the global warming problem and will actually complicate current efforts underway.** For example, **the current schedule for commercializing the above-ground sodium cooled reactor in Japan extends to 2050, making it irrelevant to addressing the climate problem. Relying on assurances that SMRs will be cheap is contrary to the experience about economies of scale and is likely to waste time and money**, while creating new safety and proliferation risks, as well as new waste disposal problems."

Solving warming requires almost 100 reactors a year---and requires several new states get enrichment capabilities

Sharon **Squassoni 8**, senior associate in the Nonproliferation Program at the Carnegie Endowment, former director of Policy Coordination in the Nonproliferation Bureau of the State Department, March 12, 2008, "Nuclear Energy and Global Warming," Testimony before the Committee on House Select Energy Independence and Global Warming, lexis

A rough approximation of where reactor capacity would expand in a climate change scenario is based on the high scenario of the 2003 MIT Study, "The Future of Nuclear Power." For 1500 GW capacity, MIT estimated that **54 countries** (an additional 23) would have commercial nuclear power programs. This essentially means a **five- fold increase** in the numbers of reactors worldwide and an annual build rate of 35 per year. In the event that smaller-sized reactors are deployed in developing countries - which makes eminent sense - the numbers could be much higher. If nuclear energy were assumed to be able to contribute a reduction of between 2 and 6 billion tons of carbon per year as outlined in the Stern Report, the resulting reactor capacity would range between 1800 GWe and 4500 GWe - increases ranging from six times to ten times current capacity. This would require building between 42 and **107 reactors per year** through 2050. Impact on Uranium Enrichment Such increases in reactor capacity would certainly have **repercussions** for the front and back ends of the fuel cycle. Almost 90

percent of current operating reactors use low-enriched uranium (LEU). Presently, 11 countries have commercial uranium enrichment capacity and produce between 40 and 50 million SWU. A capacity of 1070 GWe - the one "wedge" scenario - could mean tripling enrichment capacity, requiring anywhere from 11 to 22 additional enrichment plants. A capacity of **1500 GWe would require quadrupling enrichment capacity** (see slide 4). Further, if Stern Report nuclear expansion levels are achieved, enrichment capacity would have to increase ten-fold.

Not rapid

McGrath '13 (Matt McGrath, Environment correspondent, BBC News, "Climate slowdown means extreme rates of warming 'not as likely'", http://www.bbc.co.uk/news/science-environment-22567023, May 19, 2013)

Scientists say the recent downturn in the rate of global warming will lead to lower temperature rises in the short-term. Since 1998, there has been an unexplained "**standstill**" in the heating of the Earth's atmosphere. **Writing in Nature Geoscience, the researchers say this will reduce predicted warming in the coming decades.** But long-term, the expected temperature rises will not alter significantly. "Start Quote The most **extreme projections are looking less likely** than before" **Dr Alexander Otto University of Oxford The slowdown** in the expected rate of global warming has **been studied for several years** now. Earlier this year, the UK Met Office lowered their five-year temperature forecast. But this new paper gives the clearest picture yet of how any slowdown is likely to affect temperatures in both the short-term and long-term. An international team of researchers looked at how the last decade would impact long-term, equilibrium climate sensitivity and the shorter term climate response. Transient nature Climate sensitivity looks to see what would happen if we doubled concentrations of CO2 in the atmosphere and let the Earth's oceans and ice sheets respond to it over several thousand years. Transient climate response is much shorter term calculation again based on a doubling of CO2. **The Intergovernmental Panel on Climate Change reported in 2007 that the short-term temperature rise would most likely be 1-3C (1.8-5.4F). But in this new analysis, by only including the temperatures from the last decade, the projected range would be 0.9-2.0C.** Ice The report suggests that warming in the near term will be less than forecast "**The hottest** of the **models** in the medium-term, they **are** actually looking **less likely or inconsistent with the data from the last decade alone," said Dr Alexander Otto from the University of Oxford.** "The most **extreme projections are** looking **less likely** than before."

We adapt

Mendelsohn '9 – Robert O. Mendelsohn 9, the Edwin Weyerhaeuser Davis Professor, Yale School of Forestry and Environmental Studies, Yale University, June 2009, "Climate Change and Economic Growth," online: http://www.growthcommission.org/storage/cgdev/documents/gcwp060web.pdf

These statements are largely **alarmist and misleading**. Although climate change is a serious problem that deserves attention, **society's immediate behavior has an extremely low probability of leading to catastrophic consequences.** The **science and economics** of climate change **is quite clear that emissions over the next few decades will lead to only mild consequences**. The **severe impacts** predicted by alarmists **require a century (or two** in the case of Stern 2006) **of no mitigation**. Many of the **predicted impacts assume there will be no or little adaptation**. The net economic impacts from climate change over the next 50 years will be small regardless. Most of **the more severe impacts will take more than a century or even a millennium to unfold and many of these "potential" impacts will never occur because people will adapt. It is not at all apparent that immediate and dramatic policies need to be developed to thwart long-range climate risks**. What is needed are long-run balanced responses.

United States not key to solve warming and inevitable

Grose '13 (Thomas K., National Geographic News Writer, "As U.S. Cleans Its Energy Mix, It Ships Coal Problems Abroad", March 15, 2013)

Ready for some good news about the environment? **Emissions** of carbon dioxide **in the U**nited **S**tates **are declining. But** don't celebrate just yet. A major side effect of that cleaner air in the U.S. has been the further darkening of skies over Europe and Asia. **The U**nited **S**tates essentially **is exporting** a share of **its** greenhouse gas **emissions in** the form of **coal**, data show. If the trend continues, the dramatic changes in energy use in the United States—in particular, the switch from coal to newly abundant natural gas for generating electricity—will have only a modest impact on global warming, observers warn. The Earth's atmosphere will continue to absorb heat-trapping CO2, with a similar contribution from U.S. coal. It will simply be burned overseas instead of at home. "Switching from coal to gas only saves carbon if the coal stays in the ground," said John Broderick, lead author of a study on the issue by the Tyndall Center for Climate Change Research at England's Manchester University. The U.S. Energy Information Administration (EIA) released data this week showing that United States coal **exports hit a record** 126 million short tons **in 2012,** a 17 percent increase over the previous year. Overseas shipments surpassed the previous high mark set in 1981 by 12 percent. The United States clearly is using less coal: Domestic consumption fell by about 114 million tons, or 11 percent, largely due to a decline in the use of coal for electricity. But U.S. coal production fell just 7 percent. The United States, with the world's largest coal reserves, continued to churn out the most carbon-intensive fuel, producing 1 billion tons of coal from its mines in 2012. Emissions Sink The EIA estimates that due largely to the drop in coal-fired electricity, U.S. carbon emissions from burning fossil fuel declined 3.4 percent in 2012. If the numbers hold up, it will extend the downward trend that the U.S. Environmental Protection Agency (EPA) outlined last month in its annual greenhouse gas inventory, which found greenhouse gas emissions in 2011 had fallen 8 percent from their 2007 peak to 6,703 million metric tons of CO2 equivalent (a number that includes sources other than energy, like methane emissions from agriculture). In fact, if you don't count the recession year of 2009, U.S. emissions in 2011 dropped to their lowest level since 1995. President Barack Obama counted the trend among his environmental accomplishments in his State of the Union address last month: "Over the last four years, our emissions of the dangerous carbon pollution that threatens our planet have actually fallen." The reason is clear: Coal, which in 2005 generated 50 percent of U.S. electricity, saw its share erode to 37.4 percent in 2012, according to EIA's new short-term energy outlook. An increase in U.S. renewable energy certainly played a role; renewables climbed in those seven years from 8.7 percent to 13 percent of the energy mix, about half of it hydropower. But the big gain came from natural gas, which climbed from 19 percent to 30.4 percent of U.S. electricity during that time frame, primarily because of abundant supply and low prices made possible by hydraulic fracturing, or fracking. The trend appears on track to continue, with U.S. coal-fired plants being retired at a record pace. But U.S. coal producers haven't been standing still as their domestic market has evaporated. They've been shipping their fuel to energy-hungry markets overseas, from the ports of Norfolk, Baltimore, and New Orleans. Although **demand is growing rapidly in Asia**—U.S**. coal exports to China** were on track to **double** last year—Europe was the biggest customer, importing more U.S. coal last year than all other countries combined. The Netherlands, with Europe's largest port, Rotterdam, accepted the most shipments, on pace for a 24 jump in U.S. coal imports in 2012. **The U**nited **K**ingdom, the second largest customer, **saw its U.S.** coal **imports jump** more than **70**

percent. The hike in European coal consumption would appear to run counter to big government initiatives across the Continent to cut CO2 emissions. But in the European Union, where fracking has made only its initial forays and natural gas is still expensive, **American coal is**, well, **dirt cheap.** European utilities are now finding that generating power from coal is a profitable gambit. In the power industry, the profit margin for generating electricity from coal is called the "clean dark spread"; at the end of December in Great Britain, it was going for about $39 per megawatt-hour, according to Argus. By contrast, the profit margin for gas-fired plants—the "clean spark spread"—was about $3. Tomas Wyns, director of the Center for Clean Air Policy-Europe, a nonprofit organization in Brussels, Belgium, said those kinds of spreads are typical across Europe right now. **The EU** has a **cap-and-trade** carbon **market**, the $148 billion, eight-year-old Emissions Trading System (ETS). But it's **in the doldrums because of** a huge **oversupply of permits**. That's caused the price of carbon to fall to about 4 euros ($5.23). A plan called "backloading" that would temporarily extract allowances from the market to shore up the price has faltered so far in the European Parliament. "A better carbon price could make a difference" and even out the coal and gas spreads, Wyns said. He estimates a price of between 20 and 40 euros would do the trick. "But a structural change to the Emissions Trading System is not something that will happen very quickly. A solution is years off." The Tyndall Center study estimates that the burning of **all that** exported **coal could erase** fully half the **gains the U**nited **S**tates **has made in reducing** carbon **emissions**. For huge reserves of shale gas to help cut CO2 emissions, "displaced fuels must be reduced globally and remain suppressed indefinitely," the report said. Future Emissions It is not clear that the surge in U.S. coal exports will continue. One reason for the uptick in coal-fired generation in Europe has been the looming deadline for the EU's Large Combustion Plant Directive, which will require older coal plants to meet lower emission levels by the end of 2015 or be mothballed. Before that phaseout begins, Wyns says, "**there is a** bit of a **binge going on."** Also, economic factors are at work. Tyndall's Broderick said American coal companies have been essentially selling surplus fuel overseas at low profit margins, so there is a likelihood that U.S. coal production will decrease further. The U.S. government forecasters at EIA expect that U.S. coal exports will fall back to about 110 million tons per year over the next two years, due to economic weakness in Europe, falling international prices, and competition from other coal-exporting countries. The Paris-based International Energy Agency (IEA) calls Europe's "coal renaissance" a temporary phenomenon; it forecasts an increasing use of renewables, shuttering of coal plants, and a better balance between gas and coal prices in the coming years. But **IEA does not expect** that **the global appetite** for coal **will slacken** appreciably. The agency projects that, **by 2017, coal will rival oil as the world's primary energy source,** mainly **because of skyrocketing demand in Asia. U.S. coal producers** have made clear that they **aim to tap into that growing market.**

2NC – Warming Frontline

Even if new tech solves efficiency problems, growth of the nuclear industry offsets environmental gains – accelerates all DAs to nuclear power

Fleming '7 (David Fleming, November 2007, "THE LEAN GUIDE TO NUCLEAR ENERGY A Life-Cycle in Trouble", ISBN 0-9550849-2-8,)

Lovelock may underestimate the potential of the fourfold strategy which can be described as "Lean Energy", an application of "lean thinking" – perceptive intelligence applied to systems. It consists of four aims: (1) Energy efficiency: to achieve the decisive improvements in the efficiency of energy-services made possible by the conservation and energy-saving technologies. (2) The proximity principle: to develop the potential for local provision of energy, goods and services. This major structural change, reducing the transport-dependency of goods, people and electricity, is difficult but necessary. It is achievable only incrementally, building local competence across the whole range of economics and culture. Deep reductions in travel and transport can be expected to come about rapidly and brutally as the oil market breaks down; adapting to them – and crucially, preparing for them before the event – will take longer. THE LEAN GUIDE TO NUCLEAR ENERGY 31 (3) Renewable energy: to design and build renewable energy systems to match the needs and resources of the particular place and site. (4) Tradable Energy Quotas (TEQs): to define a secure energy budget for the whole economy, involving every energy-user in the common purpose of achieving deep reductions in energy demand.79 It cannot be expected that this strategy will fill the energy gap completely, or neatly, or in time, but nor is Lovelock suggesting that nuclear energy could do so. Even if there were neither a uranium-supply problem to restrain the use of nuclear energy, nor a waste-problem, and even if it were the overriding priority for governments around the world, nuclear energy **would still fall far short** of filling the gap. It would be **impossible** to build all the nuclear power stations needed **in time,** and the energy required for construction and for building the mining-milling enrichment- transport systems would mean that a **rapidly-growing nuclear energy industry would be using more energy than it provided throughout most of its period of growth – the more rapid the growth, the deeper the energy deficit it would cause**. There are good reasons to believe that Lean Energy could do better. It would start to get results immediately. Per unit of energy-services produced, it would be about ten times cheaper. It would be flexible and sensitive to detail, making the best possible use of local conditions, skills and ingenuity. It would be able to call on the skill and cooperation of the entire population. And it would be part of an environmental and practical evolution towards reduced transport, environmental protection and strengthened local economics all coming together in a joined-up programme. 3. The oil peak Lovelock does not give enough weight to the significance of the oil peak. As this weighs in, it will establish conditions in which there is no choice but to conserve energy, whether the urgency of climate change is recognised or not. Without the oil peak to concentrate the mind, action to save the climate could be leisurely at best. With the oil peak reminding us, by repeatedly turning out the lights and stopping us filling up our cars, we will have an incentive to follow the one available option of Lean Energy with all the will and determination we can find. ———————— 32 THE LEAN GUIDE TO NUCLEAR ENERGY

No trade-off with fossil fuels – tech will just increase overall consumption

Foster et al, 10 (JOHN B. is editor of Monthly Review and professor of sociology, University of Oregon. BRETT CLARK is assistant professor of sociology, North Carolina State University. RICHARD YORK is co-editor of Organization & Environment and associate professor of sociology, University of Oregon, "Capitalism and the Curse of Energy Efficiency: The Return of the Jevons Paradox", *Monthly Review*, November 2010. Vol. 62, Iss. 6; pg. 1, 12 pgs, proquest)

The Jevons Paradox was forgotten in the heyday of the age of petroleum during the first three-quarters of the twentieth century, but reappeared in the 1970s due to increasing concerns over resource scarcity associated with the Club of Rome's Limits to Growth analysis, heightened by the oil-energy crisis of 1973-74. As energy efficiency measures were introduced, economists became concerned with their effectiveness. This led to the resurrection, at the end of the 1970s and the beginning of the 1980s, of the general question posed by the Jevons Paradox, in the form of what was called the "rebound effect." This was the fairly straightforward notion that engineering efficiency gains normally led to a decrease in the effective price of a commodity, thereby generating increased demand, so that the gains in efficiency did not produce a decrease in consumption to an equal extent. The **Jevons Paradox** has often been relegated to a more extreme version of the **rebound effect**, in which there is a **backfire**, or a rebound of more than 100 percent of "engineering savings," **resulting in an increase rather than decrease in the consumption** of a given resource.30 Technological optimists have tried to argue that the rebound effect is small, and therefore environmental problems can be solved largely by technological innovation alone, with the efficiency gains translating into lower throughput of energy and materials (dematerialization). Empirical evidence of a substantial rebound effect is, however, strong. For example,

technological advancements in motor vehicles, which have increased the average miles per gallon of vehicles by 30 percent in the United States since 1980, have not reduced the overall energy used by motor vehicles. Fuel consumption per vehicle stayed constant while the efficiency gains led to the augmentation, not only of the numbers of cars and trucks on the roads (and the miles driven), but also their size and "performance" (acceleration rate, cruising speed, etc.) - so that SUVs and minivans now dot U.S. highways. At the macro level, the Jevons Paradox can be seen in the fact that, even though the United States has managed to double its energy efficiency since 1975, its energy consumption has risen dramatically. Juliet Schor notes that over the last thirty-five years: energy expended per dollar of GDP has been cut in half. But rather than falling, energy demand has increased, by roughly 40 percent. Moreover, demand is rising fastest in those sectors that have had the biggest efficiency gains - transport and residential energy use. Refrigerator efficiency improved by 10 percent, but the number of refrigerators in use rose by 20 percent. In aviation, fuel consumption per mile fell by more than 40 percent, but total fuel use grew by 150 percent because passenger miles rose. Vehicles are a similar story. And with soaring demand, we've had soaring emissions. Carbon dioxide from these two sectors has risen 40 percent, twice the rate of the larger economy. Economists and environmentalists who try to measure the direct effects of efficiency on the lowering of price and the immediate rebound effect generally tend to see the rebound effect as relatively small, in the range of 10 to 30 percent in high-energy consumption areas such as home heating and cooling and cars. But once the indirect effects, apparent at the macro level, are incorporated, the Jevons Paradox remains extremely significant. It is here at the macro level that scale effects come to bear: improvements in energy efficiency can **lower the effective cost** of various products, propelling the overall economy and **expanding overall energy use**.31 Ecological economists Mario Giampietro and Kozo Mayumi argue that the Jevons Paradox can only be understood in a macro-evolutionary model, where improvements in efficiency result in changes in the matrices of the economy, such that the overall effect is to **increase scale and tempo of the system** as a whole.32 Most analyses of the Jevons Paradox remain abstract, based on isolated technological effects, and removed from the historical process. They fail to examine, as Jevons himself did, the character of industrialization. Moreover, they are still further removed from a realistic understanding of the accumulation-driven character of capitalist development. An economic system devoted to profits, accumulation, and economic expansion without end will tend to use any efficiency gains or cost reductions to expand the overall scale of production. Technological innovation will therefore be heavily geared to these same expansive ends. It is no mere coincidence that each of the epoch-making innovations (namely, the steam engine, the railroad, and the automobile) that dominated the eighteenth, nineteenth, and twentieth centuries were characterized by their importance in driving capital accumulation and the positive feedback they generated with respect to economic growth as a whole - so that the scale effects on the economy arising from their development necessarily overshot improvements in technological efficiency.33 Conservation in the aggregate is impossible for capitalism, however much the output/input ratio may be increased in the engineering of a given product. This is because all savings tend to spur further capital formation (provided that investment outlets are available). This is especially the case where core industrial resources - what Jevons called "central materials" or "staple products" - are concerned. The Fallacy of Dematerialization The Jevons Paradox is the product of a capitalist economic system that is unable to conserve on a macro scale, geared, as it is, to maximizing the throughput of energy and materials from resource tap to final waste sink. Energy savings in such a system tend to be used as a means for further development of the economic order, generating what Alfred Lotka called the "maximum energy flux," rather than minimum energy production.34 The deemphasis on absolute (as opposed to relative) energy conservation is built into the nature and logic of capitalism as a system unreservedly devoted to the gods of production and profit. As Marx put it: "Accumulate, accumulate! That is Moses and the prophets!"35 Seen in the context of a capitalist society, the Jevons Paradox therefore demonstrates the fallacy of current notions that the environmental problems facing society can be solved by purely technological means. Mainstream environmental economists often refer to "dematerialization," or the "decoupling" of economic growth, from consumption of greater energy and resources. Growth in energy efficiency is often taken as a concrete indication that the environmental problem is being solved. Yet savings in materials and energy, in the context of a given process of production, as we have seen, are nothing new; they are part of the everyday history of capitalist development.36 Each new steam engine, as Jevons emphasized, was more efficient than the one before. "Raw materials-savings processes," environmental sociologist Stephen Bunker noted, "are older than the Industrial Revolution, and they have been dynamic throughout the history of capitalism." Any notion that reduction in material throughput, per unit of national income, is a new phenomenon is therefore "**profoundly ahistorical**."37 What is neglected,

then, in simplistic notions that increased energy efficiency normally leads to increased energy savings overall, is the reality of the Jevons Paradox relationship - through which energy savings are used to promote new capital formation and the proliferation of commodities, demanding ever greater resources. Rather than an anomaly, the rule that efficiency increases energy and material use is integral to the "regime of capital" itself.38 As stated in The Weight of Nations, an important empirical study of material outflows in recent decades in five industrial nations (Austria, Germany, the Netherlands, the United States, and Japan): "Efficiency gains brought by technology and new management practices have been offset by [increases in] the scale of economic growth."39 The result is the production of mountains upon mountains of commodities, cheapening unit costs and leading to greater squandering of material resources. Under monopoly capitalism, moreover, such commodities increasingly take the form of artificial use values, promoted by a vast marketing system and designed to instill ever more demand for commodities and the exchange values they represent - as a substitute for the fulfillment of genuine human needs. Unnecessary, wasteful goods are produced by useless toil to enhance purely economic values at the expense of the environment. Any slowdown in this process of ecological destruction, under the present system, spells economic disaster. In Jevons's eyes, the "momentous choice" raised by a continuation of business as usual was simply "between brief but true [national] greatness and longer continued mediocrity. " He opted for the former - the maximum energy flux. A century and a half later, in our much bigger, more global - but no less expansive - economy, it is no longer simply national supremacy that is at stake, but the fate of the planet itself. To be sure, there are those who maintain that we should "live high now and let the future take care of itself." To choose this course, though, is to court planetary disaster. The only real answer for humanity (including future generations) and the earth as a whole is to **alter the social relations of production**, to create a system in which efficiency is no longer a curse - a higher system in which equality, human development, community, and sustainability are the explicit goals.

Too late too slow- CO2 emissions in constructions outweigh

Knight ’12 (Dr David Knight has parallel existences as: an academic scientist (Biophysics, Biochemistry, Ultrastructural Analysis); an activist with interests in climate change and civil and military nuclear power; an inventor of surgical devices based on silk; teacher of medical sciences and ecology; and sculptor. He is currently an Honorary Research Associate in Zoology at Oxford University and has held three visiting professorships and a visiting fellowship at MRC MBL Cambridge. He is interested in economics, theology and Jungian psychotherapy but has no expertise in these. He is a contributor to Feasta's book Sharing for Survival, “Climate Change and Peak Oil: two sides of the same coin?”, http://www.feasta.org/2012/07/13/climate-change-and-peak-oil-two-sides-of-the-same-coin/, July 13, 2012)

Peak oil catastrophists do not deny the importance of other peaks resulting from the depletion of gas, coal, water, phosphates for fertilizers, **uranium**, copper and the rare earth metals. The diagram above was an attempt I made a year ago to summarise four possible futures. **I now think that the “the global planned transition to nuclear power” scenario is unlikely no matter how desirable some may think it. This is because nuclear power is not zero-carbon, making it necessary for thousands of reactors to be built on a world scale to substitute for fossil fuels and make an appreciable difference to climate change. It takes a long time for a reactor to recoup the huge cash and energy input , and CO2 emissions incurred in reactor construction. This means that reactors cannot be built fast enough on a world scale to cut CO2 emissions at the rate dictated by the latest climate science**. Moreover, **even if it made sense to temporarily boost CO2 emissions and drastically reduce the supply of energy to the rest of the global economy to allow huge number of reactors to be built, peak uranium means that there would be insufficient high grade uranium ores to run them. It is too late to switch to the more abundant supplies of thorium. Fast**

neutron reactors that slowly breed their own plutonium fuel are also not the answer. No nation has so far constructed a plant that if scaled-up could economically reprocess the three different types of spent nuclear fuel fast enough for a rapidly expanding fast breeder program. Of course some would argue that a modest nuclear power programme could be combined with renewables in the Green Future scenario, but do we enough time, cash or oil left to do both and shouldn't we transition directly to the renewable sources that the world will sooner or later have to rely on?

AT: Global Nuclear Spillover

Nuclear expansion impossible – laundry list of supply and siting constraints

Lisa **Zyga**, 5-11-**2011**, "Why nuclear power will never supply the world's energy needs," PhysOrg, http://phys.org/news/2011-05-nuclear-power-world-energy.html

The 440 commercial nuclear reactors in use worldwide are currently helping to minimize our consumption of fossil fuels, but how much bigger can nuclear power get? In an analysis to be published in a future issue of the Proceedings of the IEEE, Derek Abbott, Professor of Electrical and Electronic Engineering at the University of Adelaide in Australia, has concluded that **nuclear power cannot be globally scaled to supply the world's energy needs** for numerous reasons. The results suggest that we're likely better off investing in other energy solutions that are truly scalable. As Abbott notes in his study, global power consumption today is about 15 terawatts (TW). Currently, the global nuclear power supply capacity is only 375 gigawatts (GW). In order to examine the large-scale limits of nuclear power, Abbott estimates that **to supply 15 TW with nuclear only, we would need about 15,000 nuclear reactors**. In his analysis, Abbott explores the consequences of building, operating, and decommissioning 15,000 reactors on the Earth, looking at factors such as the amount of land required, radioactive waste, accident rate, risk of proliferation into weapons, uranium abundance and extraction, and the exotic metals used to build the reactors themselves. "**A nuclear power station is resource-hungry and, apart from the fuel, uses many rare metals** in its construction," Abbott told PhysOrg.com. "The dream of a utopia where the world is powered off fission or fusion reactors is simply unattainable. Even a supply of as little as 1 TW stretches resources considerably." His findings, some of which are based on the results of previous studies, are summarized below. Land and location: **One** nuclear reactor **plant requires** about **20.5 km2** (7.9 mi2) of land to accommodate the nuclear power station itself, its exclusion zone, its enrichment plant, ore processing, and supporting infrastructure. Secondly, nuclear reactors need to be **located near a massive body of coolant water**, **but away from** dense **population** zones **and natural disaster zones**. Simply **finding** 15,000 **locations** on Earth **that fulfill these requirements is extremely challenging**. Lifetime: Every nuclear power station needs to be decommissioned after 40-60 years of operation due to neutron embrittlement - cracks that develop on the metal surfaces due to radiation. If nuclear stations need to be replaced every 50 years on average, then with 15,000 nuclear power stations, one station would need to be built and another decommissioned somewhere in the world every day. Currently, it takes 6-12 years to build a nuclear station, and up to 20 years to decommission one, making this rate of replacement unrealistic. Nuclear waste: Although nuclear technology has been around for 60 years, there is still no universally agreed mode of disposal. It's uncertain whether burying the spent fuel and the spent reactor vessels (which are also highly radioactive) may cause radioactive leakage into groundwater or the environment via geological movement. Accident rate: To date, there have been 11 nuclear accidents at the level of a full or partial core-melt. These accidents are not the minor accidents that can be avoided with improved safety technology; they are rare events that are not even possible to model in a system as complex as a nuclear station, and arise from unforeseen pathways and unpredictable circumstances (such as the Fukushima accident). Considering that these 11 accidents occurred during a cumulated total of 14,000 reactor-years of nuclear operations, scaling up to 15,000 reactors would mean we would have a major accident somewhere in the world every month. Proliferation: The more nuclear power stations, the greater the likelihood that materials and expertise for making nuclear weapons may proliferate. Although reactors have proliferation resistance measures, maintaining accountability for 15,000 reactor sites worldwide would be nearly impossible. Uranium abundance: **At the current rate of uranium consumption** with conventional reactors, **the world supply of viable uranium**, which is the most common nuclear fuel, **will last for 80 years. Scaling consumption up** to 15 TW, the viable uranium **supply will last for less than 5 years**. (Viable uranium is the uranium that exists in a high enough ore concentration so that extracting the ore is economically justified.) Uranium extraction from seawater: Uranium is most often mined from the Earth's crust, but it can also be extracted from seawater, which contains large quantities of uranium (3.3 ppb, or 4.6 trillion kg). Theoretically, that amount would last for 5,700 years using conventional reactors to supply 15 TW of power. (In fast breeder reactors, which extend the use of uranium by a factor of 60, the uranium could last for 300,000 years. However, Abbott argues that these reactors' complexity and cost makes them uncompetitive.) Moreover, as uranium is extracted, the uranium concentration of seawater decreases, so that greater and greater quantities of water are needed to be processed in order to extract the same amount of uranium. Abbott calculates that the volume of seawater that would need to be processed would become economically impractical in much less than 30 years. Exotic metals: **The** nuclear **containment vessel is made of** a variety of **exotic rare metals** that control and contain the nuclear reaction: **hafnium** as a neutron absorber, **beryllium** as a neutron reflector, **zirconium** for cladding, and **niobium** to alloy steel and make it last 40-60 years against neutron embrittlement. Extracting these metals raises issues involving cost, sustainability, and environmental impact. In addition, these metals have many competing industrial uses; for example, hafnium is used in microchips and beryllium by the semiconductor industry. If a nuclear reactor is built every day, **the global supply** of these exotic metals needed to build nuclear containment vessels **would quickly run down and create a mineral resource crisis**. This is a new argument that Abbott puts on the table, **which places resource limits on all future-generation nuclear reactors**, whether they are fueled by thorium or uranium. As Abbott notes, many of these same problems would plague fusion reactors in addition to fission reactors, even though commercial fusion is still likely a long way off.

2NC- Warming No Impact

Archeology disproves environmental extinction

AFP ’13 (Agence France-Presse, “Climate change boosted human development: study”, May 21, 2013)

PARIS — Early **humans** living in South Africa **made cultural and industrial leaps in** periods of **wetter weather**, said **a study** Tuesday that **compared** the archaeological record of **Man's evolution with** that of **climate change**. Anatomically modern humans, Homo sapiens, first made their appearance in Africa during the Middle Stone Age which lasted from about 280,000 to 30,000 years ago. Some of the earliest examples of human culture and technology are found in South Africa -- with fossil evidence of innovative spurts whose cause has left scientists puzzled. The record reveals that **a notable period of human advancement occurred** about 71,500 years ago, and another between 64,000 and 59,000 years ago. Examples of such innovation include the use of symbols, linked to the development of complex language, in engravings, the manufacture and use of stone tools and personal adornment with shell jewellery. "**We show for the first time** that **the timing of... these periods of innovation coincided with abrupt climate change**," study co-author Martin Ziegler of the Cardiff University School of Earth and Ocean Sciences told AFP of the study in the journal Nature Communications. "We found that South Africa experienced wetter conditions during these periods of cultural advance. "At the same time, large parts of sub-Saharan Africa experienced drier conditions, so that South Africa potentially acted as a refugium for early humans." Ziegler and a team reconstructed the South African climate over the past 100,000 years using a sediment core drilled out from the country's east coast. The core shows changes in river discharge and rainfall. "It offers for the first time the possibility to compare the archaeological record with a record of climate change over the same period and thus helps us to understand the origins of modern humans," Ziegler said by email. Co-author Chris Stringer of London's Natural History Museum said **the findings supported the view that population growth fuelled cultural advancement through increased human interactions.** "**Such climate-driven pulses** in southern Africa and more widely **were** probably **fundamental to the origin of key elements of** modern **human** behaviour in Africa and to the subsequent dispersal of Homo sapiens from its ancestral homeland," concluded the study.

Alt causes to the terminal impact outweigh

Guterl ’13 (Fred Guterl is an award-winning journalist and executive editor of Scientific American. He worked for ten years at Newsweek, most recently as deputy editor, covering the most important trends in science, technology, and international affairs. He lives in the New York City area with his wife and two children, “Animal Forecast Could Humans Go Extinct?”, http://mobile.slate.com/articles/health_and_science/animal_forecast/2013/02/human_extinction_could_a_mass_extinction_kill_homo_sapiens.html, February 22, 2013)

If a mass extinction is happening, climate change would not have had much time to factor into it. Most of the species loss has so far has had little to do with pumping carbon into the atmosphere. Humans as a species have ravaged the Earth in many other ways. Fishing the waters with factory trawlers, clearing forests for wood and palm oil plantations, carrying strange flora and fauna in the bilge of ships from port to port—all these things, and more, have contributed.

Warming won't cause extinction

Barrett '7 (Scott, Professor of natural resource economics @ Columbia University, "Why Cooperate? The Incentive to Supply Global Public Goods, introduction", 2007)

First, **climate change does not threaten the survival of the human species.** 5 If unchecked, it will cause other species to become extinction (though **biodiversity is being depleted now due to other reasons**). **It will alter critical ecosystems** (though **this is also happening now**, and **for reasons unrelated to climate change**). It will reduce land area as the seas rise, and in the process displace human populations. "**Catastrophic" climate change is** possible, but **not certain.** Moreover, and unlike an asteroid collision, **large changes** (**such as sea level rise** of, say, ten meters) **will likely take centuries to unfold, giving societies time to adjust.** "Abrupt" climate change is also possible, and will occur more rapidly, perhaps over a decade or two. However, **abrupt climate change** (such as a weakening in the North Atlantic circulation), though potentially very serious, **is unlikely to be ruinous.** Human-induced climate change is an experiment of planetary proportions, and we cannot be sur of its consequences. **Even in a worse case scenario**, however, global **climate change is not the equivalent of the** Earth being hit by **mega-asteroid.** Indeed, **if it were as damaging as this, and if we were sure that it would be this harmful**, then **our incentive to address this threat would be overwhelming.** The challenge would still be more difficult than asteroid defense, but we would have done much more about it by now.

Water Wars

1NC- Water Wars

The global desalination market is set to grow by 320% – extensive market data proves the plan isn't key

SBI Energy '11 [SBI Energy, a division of MarketResearch.com, publishes research reports in the industrial, energy, building/construction, and automotive/transportation markets, "Global Desalination Market will Grow 320.3% by 2020, Driven by Reverse Osmosis," August 23, http://www.sbireports.com/about/release.asp?id=2267]

Depleting water supplies, coupled with increasing water demand, are driving the global market for desalination technology, which is expected to reach $52.4 billion by 2020, up 320.3% from $12.5 billion in 2010. According to a recent report from energy research publisher SBI Energy, membrane technology reverse osmosis will see the largest growth, reaching $39.46 billion by 2020. The increasing world population, which is estimated to reach 7.52 billion by 2020, up from 6.85 billion in 2010, is depleting a limited fresh water supply with agricultural demands and urbanization leading to more water consumption per person across the globe. According to the report, industrialization is spreading advanced water extraction technology, which is quickly diminishing water resources. "Economic and population growth are the largest drivers for desalination technology," said Shelly Carr, publisher of SBI Energy. "The explosive growth of this market is due to a solution-based alternative to the diminishing supply of the world's most important resource." Desalination technology involves extracting salt and other unwanted minerals from saltwater or brackish water in order to produce fresh water. There are two types of technologies: thermal which relies on heat, and membrane which utilizes semi-permeable membranes to separate salt from seawater and brackish water. According to the report, the cost of desalination is highly influenced by the amount of energy consumed, causing energy efficient membrane technologies, specifically reverse osmosis, to be the most viable option. "The lower operating costs of membrane technologies, which include reverse osmosis, microfiltration, ultrafiltration and nanofiltration, make them a more attractive option," notes Carr. "This segment will grow significantly more than its thermal counterpart." SBI Energy's report, World Desalination Components and Technologies, provides segmented market data for desalination technologies, exhibiting where the growth will occur through 2020. It profiles fifteen major companies, examines major projects and positions of specific countries, and analyzes trends and growth drivers. It is available at: http://www.sbireports.com/redirect.asp?progid=82216&productid=6281776.

No water wars- all empirics prove

Null 1-26-12 [Schuyler, researcher at Woodrow Wilson Center's Environmental Change and Security Program, a nonpartisan research organization, "Move Beyond "Water Wars" to Fulfill Water's Peacebuilding Potential, Says NCSE Panel," http://www.newsecuritybeat.org/2012/01/move-beyond-water-wars-to-fulfill-waters-peacebuilding-potential-says-ncse-panel/]

Carl Bruch, who co-directs international programs at the Environmental Law Institute, started by saying history shows that inter-state "water wars" are "highly unlikely." He pointed to Aaron Wolf's and Peter Gleick's work cataloguing the role of water in conflict throughout human history that shows it is difficult to find even a single conflict that was fought solely over the fundamental resource. For example, climate change may bring changes in rainfall, and some studies have found a correlation between lack of rainfall and conflict, but there is no causation, said Bruch. "It's a question of governance," he said. If lack of rainfall caused conflict, there would have been war across the Sahel in 2003; instead, it only happened in Darfur, which lacked a government able to deal with the challenge (similar observations have been made about the relationship between drought and famine in the Horn of Africa).

2NC- Water Wars Defense

Private sector and treaties solves their impact

Lee '13 (Sylvia Lee leads the water program at the Skoll Global Threats Fund. March 22, 2013. World Water Day 2013: Water as a Catalyst for Peace http://www.forbes.com/sites/skollworldforum/2013/03/22/world-water-day-2013-water-as-a-catalyst-for-peace/)

The news is not all dire. Historically, **water has acted as a catalyst for peace**. In fact, **studies by experts have found that countries are more likely to cooperate over water than to fight over water**. **The Indus Water Treaty has withstood the test of two wars between India and Pakistan**. **During the Vietnam War, countries in the Mekong River basin still continued technical negotiations**. After independence, **nine countries in the Niger River Basin in Africa created a joint river basin authority to cooperatively manage their joint water resources**. In fact, over **3,600 water-related treaties have been signed in the past 1200 years**. **The role to promote and improve water cooperation is not only confined to governments.** Skoll Award for Social Entrepreneur, **Friends of the Earth Middle East/Ecopeace, is a unique organization that brings together Jordanian, Palestinian and Israeli environmentalists to promote cooperative efforts to protect the Jordan River Basin** and the Mountain Aquifer in the West Bank. **IUCN's Ecosystems for life project bring together scientists from India and Bangladesh** to do joint research projects across boundaries. **The private sector has been actively engaged in various discussions and joint initiatives such as the CEO Water Mandate, the Alliance for Water Stewardship, and the World Business Council for Sustainable Development to develop a set of guidelines for the private sector to engage in water and define "good water stewardship"**. **Since water is a common property resource, no one owns the problem and no one owns the solution**. To tackle one of the biggest challenges we face in the 21st century, **we need to continue to find innovative ways to cooperate and work together to provide water security for all.**

New tech solves

Wadhwa '13 (Vivek, Vivek Wadhwa is an Indian-American technology entrepreneur and academic. March 5, 2013. Forget The Sequester: Entrepreneurs Are Saving The Future http://www.forbes.com/sites/singularity/2013/03/05/forget-the-sequester-entrepreneurs-are-saving-the-future/)

We are also making headway in solving the global water crisis. Waterborne viruses are responsible for the majority of disease in the developing world. **There are predictions that countries such as India, China, and parts of the Middle East will run out of water and that wars will break out over supplies.** This **seems paradoxical: 71% of the earth's surface is water, and sanitizing and converting seawater is as simple as boiling it and condensing the vapor**. **The problem is the cost of energy**—it is prohibitively expensive to do this in quantity. **Two exciting solutions to the water problem are already working and ready to scale**. The first is a product by Dean Kamen called Slingshot. Kamen is the inventor of the Segway personal transporter, an insulin pump, and many other breakthroughs. **Slingshot is a vapor-**

compression water-purification machine that can produce about 30 liters of 100% pure distilled water per hour using the same power as a hair dryer consumes. It can transform dirty water from any source: rivers, oceans, and even raw sewage. Slingshot has been under development for more than a decade and was recently tested by Coca-Cola in five towns in Ghana for six months. **The devices worked flawlessly**. Kamen told me that he expects that **Slingshot will cost less than $2000 when mass produced and will not require any maintenance or servicing for seven years**. **One device will produce enough clean water to support a village of 300 people**. **Coca Cola plans to test it in dozens of locations this year and will expects to roll it out on a larger scale next year**. I hope that **other organizations will also license the technology** from Kamen **and alleviate worldwide disease and suffering.**

XT: SQ Solves Desalination

Global desalination will skyrocket and it's economical- no need for the plan

Pike Research '10 [Pike Research, a part of Navigant Consulting's global Energy Practice, is a market research and consulting team that provides in-depth analysis of global clean technology markets, "Desalination Plants to Attract $87.8 Billion in Investment by 2016," Dec. 20, http://www.pikeresearch.com/newsroom/desalination-plants-to-attract-87-8-billion-in-investment-by-2016]

Desalination technologies represent one of the brightest hopes to address the challenge of meeting the world's growing demand for freshwater. While the capital costs associated with desalination plant construction remain high, a recent report from Pike Research finds that costs are falling steadily for several key technologies, which will make seawater-to-freshwater conversion more affordable for a variety of applications. The cleantech market intelligence firm forecasts that increased construction of desalination plants will generate a cumulative capital investment of $87.8 billion worldwide during the period from 2010 to 2016. "Desalination market growth is being driven by a combination of dwindling water resources, population growth and urbanization, and lower desalination costs," says Pike Research president Clint Wheelock. "While we are forecasting a slowdown in the market over the next two years, largely due to the lingering effects of the global financial crisis, the outlook for the longer term remains strong, and we anticipate that desalination capital investment will double within six years." Wheelock adds that membranes, which serve as very efficient barriers to salts that are dissolved in seawater and brackish water, are being utilized as a cost-effective means of desalination in a variety of settings. The single most applied membrane technology is reverse osmosis. Thermal processes, including multi-stage flash distillation, multiple effect distillation, and vapor compression, are also being deployed in desalination plants. Pike Research's analysis finds that the desalination market brings together a wide variety of industry players including engineering, procurement, and construction (EPC) companies, desalination plant suppliers, construction companies, operation and maintenance service providers, financial institutions, consulting engineers, and suppliers of pumps, valves, membranes, pressure vehicles, and chemicals. Pike Research's study, "Desalination Technology Markets", analyzes emerging technologies and market opportunities in the global desalination industry. It explores a variety of market growth drivers including dwindling water resources, population, pollution, and falling desalination system costs. Key industry players are profiled and country-level market forecasts are provided for key global markets through 2016. An Executive Summary of the report is available for free download on the firm's website.

The desalination market is rapidly expanding- it's a tech of choice

Arab News 8-13-12 ["Desalination is technology of choice," http://www.arabnews.com/desalination-technology-choice]

It is a fact now that desalination is a technology of choice, as the global water desalination market is expected to expand at a compound annual growth rate of 9.5 percent over the next 10 years, says a top researcher. The interest in desalination technologies is growing due to the fact that there is insufficient fresh water to meet the daily drinking and sanitation needs of all the earth's inhabitants, said professor Nidal Hilal. Worldwide desalinated water supply must triple by 2020 to meet the demands of a growing human population, said the expert. Hilal,is a professor in Nano-membranology and Water Technologies at Masdar Institute and the editor-in-chief of Desalination, the international journal on the science and technology of desalting and water purification.

Desalination tech is poised for massive expansion over the next few years

Water & Wastes Digest '09 ["Global Desalination Market to Triple Over Next 10 Years," March 27, http://www.wwdmag.com/global-desalination-market-triple-over-next-10-years]

The global market for desalinating seawater and brackish water to generate new supplies of potable water will grow at a compound annual growth rate of 9.5% over the next 10 years, effectively tripling the market in size to reach a capacity of 54 billion cu meters per year, according to a recent report by Lux Research. Reverse osmosis (RO) is the dominant technology today for desalination, accounting for a 54% share of the market in 2008, but other technologies, such as cloud point and ammonia carbonate forward osmosis (FO), will vie for a position in the market. "The bottom line is that there are growth opportunities in brackish water and recycling, but RO is so entrenched that its variations will dominate for 20 years, with new technologies coming to market only through RO hybridization," said Michael LoCascio, a senior analyst at Lux Research and the report's lead author.

Solvency

1NC- Frontline

Solvency takes decades

Dylan **Ryan 11**, Masters in Mechanical Engineering, expertise in energy, sustainability, Computer Aided Engineering, renewables technology; Ph.D. in solar energy systems, 2011, "Part 10 – Small modular reactors and mass production options," http://daryanenergyblog.wordpress.com/ca/part-10-smallreactors-mass-prod/

So there are a host of practical factors in favour smaller reactors. But what's the down side? Firstly, economies of scale. With a small reactor, we have all the excess baggage that comes with each power station, all the fixed costs and a much smaller pay-off. As I noted earlier, even thought many smaller reactors are a lot safer than large LWR's (even a small LWR is somewhat safer!) you would still need to put them under a containment dome. It's this process of concrete pouring that is often a bottle neck in nuclear reactor construction. We could get around the problem by clustering reactors together, i.e putting 2 or 4 reactors not only on the same site but under the same containment dome. The one downside here is that if one reactor has a problem, it will likely spread to its neighbours. How much of a showstopper this fact is depends on which type of reactors we are discussing. Also, in the shorter term small reactors would be **slower to build**, especially many of those we've been discussing, given that they are often made out of non-standard materials. **Only a few facilities in the world** could build them as the **entire nuclear manufacturing industry** is currently geared towards large LWR's. **Turning that juggernaut around would take decades**. So by opting for small reactors while we'd get safer more flexible reactors, we be paying for it, as these reactors would be slower to build (initially anyway) and probably more expensive too.

No market for nuclear energy due to natural gas and other factors mean no adoption- can't solve

Lordan '12 (Rebecca Lordan, Energy Policy Institute at Chicago, "Bite-Size Nuclear Reactors: More Than We Can Chew?", http://chicagopolicyreview.org/2012/04/16/bite-size-nuclear-reactors-more-than-we-can-chew/, April 16, 2012,)

In their recent white paper "Small Modular Reactors—Key to Future Nuclear Power in the US," Robert Rosner of the Energy Policy Institute at Chicago and Steven Goldberg of Argonne National Laboratory argue that America's history with Small Modular Light Water Nuclear Reactors (SMRs), the growing demand for carbon-free energy sources, and a potential cost advantage make SMRs ready for prime time: the U.S. nuclear energy market. While each module generates only 300 megawatts or less of power – a typical nuclear reactor generates approximately one gigawatt (1000 megawatts) – deploying a system of SMRs could have a dramatic effect on the domestic energy portfolio. Light water SMRs are governed by the same physical principles as the aging fleet of traditional reactors. Atomic reactions generate heat that boils water into steam, which in turn drives electricity-generating steam turbines. However, the smaller size of SMRs allows these power plants to be placed underground, situated in more diverse geographical locations, and, potentially, manufactured in a standard, cost-effective way. There are two major design advantages of a smaller size. First, SMRs are less susceptible to potential attack. When they are placed underground, SMRs have an additional layer of protection that intruders must penetrate before gaining access to the site. Underground modules are also more difficult to target from the air. Second, because SMRs are submerged underwater, they are better protected from natural disasters — especially earthquakes — because the water can absorb seismic forces and shaking. The authors argue that SMRs would not suffer the catastrophic safety failures that occurred at the Fukushima Dai-ichi Plant in March of 2011. But **can these SMRs compete economically with alternative green technologies and with low natural gas prices**? Rosner and Goldberg assert that **they can, but only under particular economic and regulatory conditions.** SMR plants have two major cost advantages over alternative energies: they can be built one module at a time, thereby reducing up-front capital costs, and they can take advantage of existing nuclear infrastructure such as component and equipment facilities. Large-scale reactors are constructed on-site from scratch. As a result, each site requires expensive capital investments and is staffed by a novice local workforce that must learn by doing; costly delays are common due to small errors. In contrast, production of SMRs in a manufacturing facility would benefit from an experienced workforce and machine-controlled precision and could create economies of scale. Under these conditions, SMRs would not only be competitive with carbon-based energy, but would have lower unit-energy prices than other alternative energy options, such as wind, solar photovoltaic, solar thermal, and geothermal, which are less efficient and less reliable and suffer from high capital costs. However, **alternative energies do not face the same regulatory challenges as nuclear power. In order to further decrease the costs of SMRs to a competitive level, the Nuclear Regulatory Commission (NRC) would have to rule in favor of changing license requirements. One such change would be a reduction in the number of onsite staff required at**

nuclear facilities, which would decrease operating and infrastructure costs. Rosner and Goldberg also outline a variety of ways that the government should support the nascent SMR industry, including cost incentives and market transition strategies to help limit the uncertainty and risk that often deter private investors. The authors map out a five-step business plan beginning with a first-of-a-kind pilot plant and ending with fully developed facilities that have achieved economies of scale. But **there is much to do before their plan is realized**. **While the paper mainly examines SMRs based on economic and manufacturing factors, the regulatory challenges that small reactors face are significant. Despite the country's history with SMRs, this difficult regulatory environment and anti-nuclear sentiment after the events at Fukushima Dai'ichi will make deploying small modular reactors on the scale the authors imagine a challenge.**

PPA fails

Jeffrey **Marqusee 12**, Executive Director of the Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP) at the Department of Defense, March 2012, "Military Installations and Energy Technology Innovation," in Energy Innovation at the Department of Defense: Assessing the Opportunities, http://bipartisanpolicy.org/sites/default/files/Energy%20Innovation%20at%20DoD.pdf

There is an extensive literature on the impediments to commercialization of these emerging energy technologies for the building infrastructure market. 82 A key impediment (and one found not just in the building market) is that energy is a cost of doing business, and thus rarely the prime mission of the enterprise or a priority for decision makers. In contrast to sectors such as information technology and biotechnology, where advanced technologies often provide the end customer with a new capability or the ability to create a new business, improvements in energy technology typically just lower the cost of an **already** relatively **low-cost commodity (electricity).** As a result, the market for new technology is highly price sensitive, and life-cycle costs are sensitive to the operational efficiency of the technology, to issues of maintenance, and to the estimated lifetime of the component. Thus, **a first user of a new energy technology bears significantly more risk while getting the same return** as subsequent users. A second impediment is the slow pace of technological change in the U.S. building sector: it takes years, if not decades, for new products to achieve widespread use. One reason for this is that many firms in the industry are small; they lack the manpower to do research on new products, and they have limited ability to absorb the financial risks that innovation entails. A third impediment to the widespread deployment of new technologies arises from the fragmented or distributed nature of the market; decisions are usually made at the individual building level, based on the perceived return on investment for a specific project. The structural nature of decision making and ownership can be a significant obstacle to technological innovation in the commercial market: n The entity that bears the up-front capital costs is often not the same as the one that reaps the operation and management savings (this is known as the "split incentives" or "principal agent" problem). n Key decision makers (e.g., architecture and engineering firms) face the **liabilities** associated with operational failure but **do not share in the potential savings, creating an incentive to prefer reliability over innovation**. n Financing mechanisms for both energy efficiency (by energy service companies using an ESPC) and distributed and renewable energy generation (through PPA and the associated financing entities) require high confidence in the long-term (decade-plus) performance of the technology, and thus **investors are unwilling to put capital at risk on new technologies**. Other significant barriers to innovation include a lack of information, which results in high transactional costs, and an inability to properly project future savings. As the National Academy of Sciences has pointed out, the lack of "evidence-based" data inhibits making an appropriate business case for deployment. 83 The return on the capital investment is often in terms of avoided future costs. Given the limited visibility of those costs when design decisions are being made, it is often hard to properly account for them or see the return. This is further exacerbated by real and perceived discount rates that can lead to suboptimal investment decisions. Finally, the lack of significant operational testing until products are deployed severely limits the rapid and complete development of new energy technologies. The impact of real-world conditions such as building operations, variable loads, human interactions, and so forth makes it very difficult to optimize technologies, and specifically inhibits any radical departure from standard practice. These barriers are particularly problematic for new energy efficiency technologies in the building retrofit market, which is where DoD has the greatest interest. In addition to these barriers, which are common across DoD and the commercial market, DoD has some unique operational requirements (security and information assurance issues) that create other barriers.

No solvency – NRC regulation and accidents

Wellock '13 (Thomas Wellock, NRC Historian, "Waves of Uncertainty: The Demise of the Floating Reactor Concept (Part II)", http://public-blog.nrc-gateway.gov/2013/09/26/waves-of-uncertainty-the-demise-of-the-floating-reactor-concept-part-ii/, September 26, 2013)

Offshore Power Systems, apparently, did not appreciate that putting land-based reactors out to sea was bound to raise new safety, environmental and regulatory questions. **Concerns about** ship **collisions**, off-shore **fishing** grounds, **barge sinking and** the challenge of **creating a new regulatory process for floating reactors were** just some of the **unique issues** facing regulators. Even the trade press raised concerns. **Nuclear News worried about the "incredibly tangled mass of overlapping jurisdictions, state, national, and international law, inter-agency authority"** that included new players such as the U.S. Coast Guard. Drawing from a 1978 GAO report. Drawing from a 1978 GAO report. Events conspired to worsen OPS's prospects. The oil crisis that began in 1973 made construction financing expensive and slowed electricity consumption. Facing slack demand, PSEG postponed delivery of the first floating plant from 1981 to 1985 and later to 1988. Tenneco backed out of the OPS partnership in 1975. With the entire enterprise threatened, Westinghouse and the Florida Congressional delegation asked the federal government to purchase four plants. But, the prospect of "bailing out" OPS did not appeal to officials in the Ford Administration. The purchase proposal died. **Floating reactors did not solve regulatory or political problems**. **The production** facility in Jacksonville **needed an NRC** manufacturing **license. There were so many technical and regulatory uncertainties that the licensing review ran three years behind schedule**. A 1978 report from the U.S. General Accounting Office criticized the NRC for what it believed was an incomplete safety review, particularly for not accounting for impacts on the ocean ecosystem during an accident where a melting reactor core broke through the bottom of the barge. **Local and state opposition to the plant was intense**. Nearby counties voted in non-binding referendums 2 to 1 against the Atlantic Generating Station, and the New Jersey legislature refused to introduce a bill to turn the offshore site over to PSEG. Westinghouse held out hope for a brighter future; PSEG didn't. In late 1978, the utility announced it canceled its orders for all four of its floating plants. Slack demand, it noted, was "the only reason" for the cancellations. "We simply will not need these units" in the foreseeable future, a utility official admitted. **Others blamed excessive regulation**. In March 1979, John **O'Leary**, a Department of Energy deputy secretary, **provided** to the White House **a "grim—even alarming report**," as one staffer said, that **the NRC delays with the OPS license were symptomatic of a larger problem**. "**It has become impossible to build energy plants in America**" O'Leary said, **due to excessive environmental regulations and an indecisive bureaucracy.** Environmental **laws**, O'Leary complained, had created **"a chain of hurdles which effectively kill energy projects**" and damage to the nation's economy. He wanted presidential action. Drawing from a 1978 GAO report. Drawing from a 1978 GAO report. Events rendered O'Leary's plea for action moot. Two and a half weeks later the Three Mile Island accident occurred, ending any hope of an imminent industry rebound. The accident raised anew questions about a core melt accident and further delayed the manufacturing license. The NRC did not issue a license until 1982. In 1984, Westinghouse formally abandoned the OPS enterprise, dismantled the Jacksonville facility, and sold its huge crane to China. **Going to sea**, OPS discovered, **did not allow it to escape the problems that beset nuclear power**. A novel technological solution could not overcome public distrust and economic, technical and regulatory uncertainty. We shall see how Russia handles the challenges.

2NC- Too Slow

Solvency is decades away – even if incentives generate demand for SMRs there's no manufacturing base – increasing manufacturing capacity is an alt cause they can't resolve

ITA' 11 – International Trade Administration (U.S. Department of Commerce, February. Manufacturing and Services Competitiveness Report. "The Commercial Outlook for U.S. Small Modular Nuclear Reactors." http://trade.gov/mas/ian/build/groups/public/@tg_ian/@nuclear/documents/webcontent/tg_ian_003185.pdf)

There are also domestic policies that hinder U.S. SMR competitiveness, with some policies relevant to all nuclear suppliers and some specific to SMR deployment, both at home and abroad. One obstacle is **diminished manufacturing capacity**. **U.S. nuclear competitiveness is hampered because U.S. manufacturing capacity has been eroded through** the lack of new reactor construction during the **past few decades**. Some **government resources to help manufacturers are not appropriate for nuclear suppliers, or** the resources **exclude the suppliers entirely**. For example, only two U.S. nuclear manufacturers qualified for the advanced energy manufacturing tax credit. **The timeline to be eligible for the credit requires a facility to be up and running four years from certification. Some U.S. firms say that the timeline is too short** for many nuclear suppliers; **just acquiring the high-precision machines necessary to retool and** rebuild capacity can require **a lead time of several years**.

2050

PR Newswire '10 (PR Newswire, "IEER/PSR: 'Small Modular Reactors' No Panacea for What Ails Nuclear Power", http://www.prnewswire.com/news-releases/ieerpsr-small-modular-reactors-no-panacea-for-what-ails-nuclear-power-104024223.html, September 29, 2010,)

And what about SMRs as some kind of "silver bullet" for averting global warming? The IEER/PSR fact sheet points out: "**Efficiency and most renewable technologies are already cheaper than new large reactors. The long time** -- a decade or more -- **that it will take to certify SMRs will do little or nothing to help with the global warming problem and will actually complicate current efforts underway.** For example, **the current schedule for commercializing the above-ground sodium cooled reactor in Japan extends to 2050, making it irrelevant to addressing the climate problem. Relying on assurances that SMRs will be cheap is contrary to the experience about economies of scale and is likely to waste time and money**, while creating new safety and proliferation risks, as well as new waste disposal problems."

2NC Rosner Indict

Nuclear too slow- no risk of solving

Pflaum 1/30 (Kelly Pflaum, Medill Reports Chicago, "Policy, cost pose challenges to future of nuclear energy", http://news.medill.northwestern.edu/chicago/news.aspx?id=214782, January 30, 2013)

Robert Rosner (with microphone), along with Mark Peters and Alan Schriesheim, president of the Chicago Council on Science and Technology, answer questions about the past, present and future of nuclear techniology. Kelly Pflaum/MEDILL Public support for nuclear energy is at about 65 percent in the United States. The industry must take responsibility to increase public support with information about advancing safety and technology, according to Argonne National Laboratory Deputy Laboratory Director for Programs, Mark Peters. **Nuclear energy continues to play an important role in meeting U.S. energy needs, the source of 20 percent of the country's elelctricity. Yet it will be 20 to 30 years before we can expect to see a major revival in the nuclear energy industry, according to Rober Rosner, director of the Energy Policy Institute at Chicago. Current policy and the safety and cost of operations all present challenges to the future of nuclear energy, Rosner said at a recent nuclear energy program sponsored by the Chicago Council on Science and Technology.** Illinois generates nearly half of its electricity from nuclear power, ranked first in the nation for net nuclear generating capacity. But a state moratorium, put in place in 1987, bans the construction of any new nuclear reactors. **In the United States, the fundamental problem is with political issues that have stood in the way solving how we deal with nuclear waste.** That's not a technical issue, Rosner said. "It is stunning that we actually do not have a nuclear waste strategy that's formal, that's agreed upon and that's funded." In addition to the safety of waste management, the safety of plant operations is also a major concern as technology moves forward, Rosner said. He said he believes that the type of reactors that should be used in the future in the United States would have passive safety features, such as Generation III reactors. It is important to note that really serious incidents are extremely rare, Rosner said. There have only been three major incidents since the beginning of commercial nuclear power - at Three Mile Island in Pennsylvania, Chernobyl in Russia and Fukushima. "When you look at, first, Three Mile Island, then Chernobyl and now Fukushima, the industry does show the ability to learn from these accidents. We're in the midst of learning from Fukushima," said Mark Peters, deputy laboratory director for programs at Argonne National Laboratory. With regard to the threat of proliferation as a result of reactor programs, Rosner said that nuclear technology is knowledge, and "it's a mistake to think that we can really segregate knowledge at this time." **The cost of building new plants is enormous and essentially unaffordable for utilities.** Construction of two new reactors at Plant Vogtle in Georgia, which are slated for commercial operation by 2017, carries a $14 billion price tag and they are part of an exisitng plant, according to Atlanta-based Southern Co., the energy company behind the construction plans.

2NC- Natural Gas

No market for SMR's- natural gas makes them uncompetitive

McMahon '12 (Jeff McMahon, Contributor for Forbes, "Small Modular Nuclear Reactors By 2022 -- But No Market For Them", http://www.forbes.com/sites/jeffmcmahon/2012/05/23/small-modular-reactors-by-2022-but-no-market-for-them/, May 23, 2012,)

A small modular reactor design. The Department of Energy will spend $452 million—with a match from industry—over the next five years to guide two small modular reactor designs through the nuclear regulatory process by 2022. But **cheap natural gas could freeze even small nuclear plants out of the energy market well beyond that date.** DOE accepted bids through Monday for companies to participate in the Small Modular Reactor program. A number of reactor manufacturers submitted bids, including NuScale Power and a collaboration that includes Westinghouse and General Dynamic. "This would allow SMR technology to overcome the hurdle of NRC certification – the 'gold standard' of the international nuclear industry, and would help in the proper development of the NRC's regulatory framework to deal with SMRs," according to Paul Genoa, Senior Director of Policy Development at the Nuclear Energy Institute. Genoa's comments are recorded in a summary released today of a briefing given to Senate staff earlier this month on prospects for small modular reactors, which have been championed by the Obama Administration. DOE defines reactors as SMRs if they generate less than 300 megawatts of power, sometimes as little as 25 MW, compared to conventional reactors which may produce more than 1,000 MW. Small modular reactors can be constructed in factories and installed underground, which improves containment and security but may hinder emergency access. **The same summary records doubt that SMRs can compete in a market increasingly dominated by cheap natural gas. Nuclear Consultant Philip Moor told Senate staff that SMRs can compete if natural gas costs $7 to $8 per million BTU—gas currently costs only $2 per MBTU—or if carbon taxes are implemented, a scenario political experts deem unlikely.** "Like Mr. Moor, Mr. Genoa also sees the economic feasibility of SMRs as the final challenge. **With inexpensive natural gas prices and no carbon tax, the economics don't work in the favor of SMRs,**" according to the summary. The SMRs most likely to succeed are designs that use the same fuels and water cooling systems as the large reactors in operation in the U.S. today, according to Gail Marcus, an independent consultant in nuclear technology and policy and a former deputy director of the Department of Energy Office of Nuclear Energy, simply because the NRC is accustomed to regulating those reactors. "Those SMR designs that use light water cooling have a major advantage in licensing and development [and] those new designs based on existing larger reactor designs, like Westinghouse's scaled-down 200 MW version of the AP-1000 reactor, would have particular advantage." This is bad news for some innovative reactor designs such as thorium reactors that rely on different, some say safer, fuels and cooling systems. **Senate staff also heard criticism of the Administration's hopes for SMRs from Edwin Lyman, Senior Scientist in the Global Security Program at the Union of Concerned Scientists:** The last panelist, **Dr. Lyman, provided a more skeptical viewpoint on SMRs, characterizing public discussion on the topic as "irrational exuberance." Lyman argued that, with a few exceptions, safety characteristics were not significantly better than full-size reactors, and in general, safety tended to rely on the same sorts of features. Some safety benefits, he stated, also declined as reactor power approached the upper bound of the SMR category….** Lyman argued that **the Fukushima disaster should lead to a "reset" in licensing**. In his opinion, **the incident exposed numerous weaknesses in how nuclear power is regulated, and in order to remedy these oversights, regulation should be revisited.**

Reject evidence that doesn't speak to long term cost estimates – the aff's evidence is blind optimism while we've got we've got super qualified analysts

Gonzalez 11 (Low Natural Gas Prices Make Nuclear Power a Losing Investment")
http://oilprice.com/Alternative-Energy/Nuclear-Power/Low-Natural-Gas-Prices-Make-Nuclear-Power-A-Losing-Investment.html

Low natural gas prices have thwarted investment in nuclear generators in the US and federal loan guarantees will not help nuclear power reach parity, experts said. Even before the accident at the Fukushima nuclear plant

in Japan, **nuclear power was seen as a losing investment, with cost estimates continuing to rise while the price of other energy sources fell, said Peter Bradford, former member of the US Nuclear Regulatory Commission and adjunct professor at Vermont Law School**. **"Wall Street rating agencies were uniformly sceptical,"** he said. Last year, utility Constellation Energy abandoned plans to add another nuclear generator to its Calvert Cliffs facility in Maryland. **Exelon, which plans to merge with Constellation, withdrew plans for a nuclear expansion in Texas after reviewing its low-carbon options and finding nuclear to be more expensive than its other choices**. "Industry spokespeople will use Fukushima to obscure the fact that new nuclear has been priced out of the market in the US for many years," Bradford said. "Under these circumstances, adding additional exposure to American taxpayers in the form of nuclear loan guarantees now being proposed in Congress can't be justified." Likely influenced by the nuclear accident, a March survey by the Civil Society Institute found that 73% of US residents do not want loan guarantees for nuclear plants. "While I know the Senate is very much pro-nuclear, I'm not certain the kind of subsidies that nuclear power needs are going to last very long," said S. David Freeman, former head of the Tennessee Valley Authority and the Sacramento Municipal Utility District. Nuclear more expensive than coal, gas – Jeffries The cost of building a nuclear plant varies from $4,500 per kW, as estimated by NRG for its cancelled project in Texas, to $6,350/kW estimated by Southern Company for its Vogtle project in Georgia, said Paul Fremont, managing director of equity research at investment banking group Jefferies. **Nuclear represents the highest cost option to construct compared to traditional technologies such as coal**, at an estimated cost of $2,000-$3,000/kW, and gas combined cycle units at $950/kW.

Natural gas means that nuclear can't compete in the market – Technology Review 8/9/12 ("A Glut of Natural Gas Leaves Nuclear Power Stalled")

The nuclear renaissance is in danger of petering out before it has even begun, but not for the reasons most people once thought. **Forget safety concerns, or the problem of where to store nuclear waste—the issue is simply cheap, abundant natural gas**. General Electric CEO Jeffrey Immelt caused a stir last month when he told the Financial Timesthat **it's "hard to justify nuclear" in light of low natural gas prices.** Since GE sells all manner of power generation equipment, including components for nuclear plants, Immelt's comments hold a lot of weight. **Cheap natural gas has become the fuel of choice with electric utilities, making building expensive new nuclear plants an increasingly tough sell.** The United States is awash in natural gas largely thanks to horizontal drilling and hydraulic fracturing, or "fracking" technology, which allows drillers to extract gas from shale deposits once considered too difficult to reach. In 2008, **gas prices were approaching $13 per million BTUs; prices have now dropped to around $3. When gas prices were climbing, there were about 30 nuclear plant projects in various stages of planning in the United States**. **Now the Nuclear Energy Institute estimates that, at most, five plants will be built by 2020, and those will only be built thanks to favorable financing terms and the ability to pay for construction from consumers' current utility bills**. Two reactors now under construction in Georgia, for example, moved ahead with the aid of an $8.33 billion loan guarantee from the U.S. Department of Energy. **What happens after those planned projects is hard to predict.** "**The question is whether we'll see any new nuclear**," says Revis James, the director of generation research and development at the "**The prospects are not good."**

Not cost competitive – they need to win market perception of SMRs are CHEAPER than BOTH natural gas and large reactors

Biello '12 - Associate Editor at Scientific American (David, March 27, "Small Reactors Make a Bid to Revive Nuclear Power", http://www.scientificamerican.com/article.cfm?id=small-reactors-bid-to-revive-nuclear-power)

Regardless of how cheap such Small **M**odular **R**eactors **may allow nuclear to be in future, it is unlikely to be as cheap as natural-gas-fired turbines in the present**. In fact, **low natural gas prices stalled the U.S. nuclear renaissance** outside Georgia and South Carolina, long before the reactor meltdowns at Fukushima Daiichi in Japan.

"**Because of an unanticipated abundance of natural gas in the U**nited **S**tates, **nuclear energy, in general, is facing tough competition," noted an analysis** of the prospects for small modular reactors **from** the **University of Chicago** published last November. The analysis also suggested that **small reactors would be more expensive than large reactors on a per-megawatt basis until manufacturing in significant quantities has happened. "It [is] unlikely that SMRs will be commercialized without some form of government incentive.**" But the Department of Energy funding may only support two designs. **Innovation spurred by competition seems unlikely**. And that may ultimately erode the current U.S. nuclear industry advantage—from design to operation to regulation.

SMRs are a decade away – technical challenges --- there are too many designs and not enough implementation

Andres and Breetz 11. [Richard, Professor of National Security Strategy at the National War College, Senior Fellow and Energy and Environmental Security and Policy Chair in the Center for Strategic Research, Institute for National Strategic Studies, at the National Defense University, Hanna, doctoral candidate in the Department of Political Science at The Massachusetts Institute of Technology, "Small Nuclear Reactors for Military Installations: Capabilities, Costs, and Technological Implications" Institute for National Strategic Studies -- February -- www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf]

Two general points about these reactors should be ¶ emphasized. First, **even within the category of small ¶ reactors** without on-site refueling, **there are significant ¶ variations in electrical output** (10–335 MWe), coolants ¶ (water, sodium, lead, molten salt), **refueling times** (2–30 ¶ years) **and procedures** (returning the entire module to ¶ the factory, changing out the cassette, recharging the ¶ in-situ pebble bed), construction types (factory-built versus location-built), site footprints, portability, modularity, ¶ staffing requirements**, and technological readiness**. **Small ¶ reactor concepts range from designs like Westinghouse's** ¶ International Reactor Innovative and Secure (**IRIS) ¶ model, which mostly uses mature LWR technology** in ¶ a stationary, site-constructed 335 MWe plant, **to Hyperion's Power Module, which has been designed as a** factorysealed, truck-transportable, 25 MWe "**nuclear battery**" with ¶ minimal in-core moving mechanical components.¶ 17¶ Second, **these reactors today exist only on paper;** ¶ as Ingersoll explains, "**None of the designs are ready ¶ for construction today or have even initiated the design ¶ certification review process.**"¶ 18¶ This means that **there are ¶ unresolved economic, technical, and regulatory issues** associated with these designs. For some of the more novel ¶ concepts**, it may be a decade or more before they get design approval from the NRC.**

2NC NRC Overview

Licensing concerns take out the aff

Tucker 11 (William, energy writer for the American Spectator, "America's Last Nuclear Hope," March 2011, http://0101.nccdn.net/1_5/28c/010/2c9/America-s-Last-Nuclear-Hope-Tucker-TAS.pdf-http://0101.nccdn.net/1_5/28c/010/2c9/America-s-Last-Nuclear-Hope-Tucker-TAS.pdf)

So why isn't there more coordination between the civilian and military efforts? In fact there is some. The first commercial reactor built at Shippingport, Pennsylvania, in 1957 was actually a submarine reactor "beached" by Admiral Rickover's Navy. Since then hundreds of nuclear technicians trained in the Navy have gone on to find jobs in the nuclear industry. One reason most new reactors are now being planned in the South is the large presence of Navy veterans. But beyond that, the Navy's long experience with nuclear does not seem to build anyone's confidence that the technology can be handled in the civilian field. Instead, **the great impediment to all this is the N**uclear **R**egulatory **C**ommission, **the gargantuan Washington bureaucracy** that regularly wins awards as the "best place to work in the federal government" **yet seems unable to deliver on its main purpose, which is to issue licenses for nuclear reactors**. **The NRC last issued a license for a nuclear reactor in 1976. No one knows if it will ever issue one again**. One utility, Southern Electric, has received permission to begin site clearance at the Vogtle plants 3 and 4 in Georgia. But the Vogtle plants will be Westinghouse AP1000s, a model for which the NRC has not yet issued design approval, let alone permission to build particular projects. Four AP1000s are already well under construction in China, with the first scheduled to begin operation in 2013. Yet **here the NRC is still trying to figure out how to protect the reactor from airplanes**. **Even though the containment structure is strong enough to withstand a direct hit from a commercial jet, the NRC asked Westinghouse to put up a concrete shield to protect adjacent buildings. Then after Westinghouse had completed the revision, the NRC decided the shield might fall down in an earthquake. Further revisions are still pending. When Hyperion first approached the NRC about** design approval for its **s**mall **m**odular **r**eactor in 2006, the **NRC essentially told it to go away** -- **it didn't have time for such small potatoes.** Since then the NRC has relented and sat down for discussions with Hyperion last fall. Whether the approval process can be accelerated is still up for grabs, but at least there has been a response from the bureaucracy. OR COURSE, the NRC is only responding to the lamentations and lawsuits from environmentalists and nuclear opponents who have never reconciled themselves to the technology, even though nuclear's carbon-free electricity is the only reliable source of power that promises to reduce carbon emissions. **If a new reactor project does ever make it out of the NRC, it will be contested in court for years, with environmental groups challenging the dotting of every i and crossing of every t in the decision-making. It will be a miracle if any proposal ever makes it through the process.**

NRC is still banning licenses

Davis '13 (Dorothy Davis, Content Director for PennEnergy, "Calvert Cliffs 3 nuclear power plant license denied again", http://www.pennenergy.com/articles/pennenergy/2013/03/calvert-cliffs-3-nuclear-power-plant-license-denied-again.html, March 12, 2013)

The Nuclear Regulatory Commission (**NRC) has upheld a decision to deny a combined construction permit and operating license (COL) for the proposed Calvert Cliffs 3 (CC3) nuclear power plant in Maryland.** On Monday the **NRC issued an order rejecting a petition of review from Unistar Nuclear Energy of an August 2012 ruling from the commission's Atomic Safety and Licensing Board denying the COL application for the CC3 project. The move marks the first time in history that the NRC has upheld a license denial for a commercial nuclear reactor, reports Nuclear Power International.**

Waste Management Act means it the NRC is banned from giving licenses

Smith and Tracy '12 (Rebecca Smith and Ryan Tracy, "U.S. Regulator Halts Nuclear-Plant Licensing", http://online.wsj.com/article/SB10000872396390443517104577575561397701568.html, August 7, 2012)

The U.S. **N**uclear **R**egulatory **C**ommission **said it would stop issuing licenses for** nuclear **plants until it addresses problems with its** nuclear-**waste policy** that were raised by a recent federal appeals court decision. The move, while not expected to affect any nuclear plants right away, shows how **the standstill in finding a permanent American nuclear waste dump could undermine the expansion of nuclear power**, which is already facing a challenge from cheaper natural gas. License Freeze U.S. reactors with pending license renewal applications In June, **the U.S. Court of Appeals for the District of Columbia Circuit said** the **NRC's approach to managing nuclear waste was inconsistent with federal environmental standards.** Until the ruling, the NRC had relied on what is known as the Waste Confidence Decision when issuing new licenses for proposed plants and extending the licenses of existing plants. Under that doctrine, the NRC said it could issue licenses because it had confidence that the U.S. eventually would create a permanent repository. But the Obama administration's elimination of funding for a proposed repository at Yucca Mountain in Nevada made that assertion less believable. **The appeals court struck down the NRC's finding that there was "reasonable assurance" a permanent waste site would be created "when needed."** It also rejected the NRC's finding that spent fuel could likely be stored safely for as long as 60 years beyond a plant's licensed life, either in pools or giant casks. Even if the NRC thinks pool leaks have been harmless so far, the court said, the NRC must still assess the probability and consequence of bigger leaks and other accidents. **The NRC's move on Tuesday could delay licensing decisions for a year or more, depending on how long it takes the agency to fix the problems** identified by the court. **No such decisions were expected this year.** Even a multiyear delay would not cause existing reactors to shut down. They can continue to operate so long as they sought extensions at least five years before their licenses expired. Environmentalists responded positively to the NRC decision, the first major step by incoming Chairwoman Allison Macfarlane, who is a nuclear waste expert. Richard Webster of the Public Justice environmental group said the courts wouldn't allow the NRC to operate under the "illusion" that the existing system of waste storage is sufficient. **Diane Curran, an environmental attorney** who represented several citizens' groups on the issue, **said the NRC has "a lot of homework" and "it is hard for me to see how [the agency's response] could be finished in a year."** Ellen Ginsberg, general counsel for the Nuclear Energy Institute, a trade organization for nuclear operators, said the NRC's decision was unavoidable given the court's decision. She said the federal government "has not met its statutory obligation" to relieve utilities of nuclear waste. An NRC spokesman said that within weeks, the agency's staff would send the five-member commission a series of options for dealing with the court decision. Nuclear operators have said they are willing to beef up on-site storage of nuclear waste to ensure that the waste can be safe for longer periods. If the NRC chooses that route, they say they hope that the agency would apply standards to the industry as a

whole. Also, if regulators impose additional requirements, Ms. Ginsberg said, "the federal government will be further obligated to reimburse utilities and their ratepayers for those additional costs." Environmentalists are worried about leaking spent fuel pools and the risk of fires if something happens that allows water to boil off or drain away. That fear became more acute in the aftermath of the March 2011 accident at the Fukushima Daiichi nuclear power plant in Japan, which suffered explosions in the vicinity of spent fuel pools. One option for the U.S. is requiring operators to move spent fuel more quickly to dry storage casks.

Means the NRC is frozen

PowerEngineering '12 (Power Engineering, Online Energy Magazine, "The Nuclear License Freeze", http://www.power-eng.com/index.html, September 7, 2012)

With temperatures reaching 115 degrees and eclipsing 100 degrees for almost a month straight in Tulsa, Okla., a long cold front sounds nice to me. Utilities in the region surely are hoping for some reprieve, too. **For** those **utilities seeking license** renewals to extend the operating life of their nuclear power plants, and those wanting to build and operate new plants, **the N**uclear **R**egulatory **C**ommission**'s** order, or '**freeze'**, as it is being referred to, on Aug. 7 **may not be the news they wanted to hear.** In response to the June ruling from the U.S. Court of Appeals for the D.C. Circuit that it was vacating and remanding the NRC's waste confidence rule, the five-person commission issued an order stating **the regulators would not issue** final reactor **licenses** or 20-year license renewals for existing plants **until the agency addresses a recent court ruling on waste confidence.** Waste confidence, according to the NRC, is a generic finding that spent nuclear fuel can be safely stored at reactor sites for decades in either spent fuel pools or dry casks, and that a repository will be available for final disposal of the spent fuel. The NRC order, though, also said current licensing reviews and proceedings "should continue to move forward." "We believe it is appropriate to halt nuclear licensing decisions and stop creating an inter-generational debt of nuclear waste that will burden our children and grandchildren for centuries to come," said Stephen Smith, executive director of Southern Alliance for Clean Energy. Here's the kicker. One thing that has been misunderstood is the fact that the 'freeze' does not mean staffers of the U.S. NRC will begin packing up their belongings and shutting down shop. In total, the order could impact licensing reviews for as many as 21 new reactors and 12 license renewals for existing reactors. The NRC will continue to review these renewal and COL applications. The order does not affect licenses already issued or renewed, such as the COLs for Plant Vogtle in Georgia and the V.C. Summer station in South Carolina. "Although there may be some delay in issuing some renewed licenses, NRC regulations provide that plant operation can continue beyond the original license term and until there is a decision on the renewal application, so long as it has been filed in a timely manner," said Ellen Ginsberg, NEI's vice president and general counsel. That statement sums it up. Some delay in relicensing. But is this decision really going to generate a long delay? Probably not. "The earliest potential final licensing decisions were the Levy County COL and the Indian Point license renewal, but both of those still have a hearing to go through in any case," said NRC spokesperson David McIntyre in an email. "Those hearings aren't expected to be finished until sometime next year." As far as issuing new COLs, it does not seem apparent that new plants are moving along quickly anyway. Are those looking to build new nuclear generation really going to be impacted by this? Doesn't seem likely. The Nuclear Energy Institute, the lobbyist group for the nuclear industry, has also made that clear. Pending applications for new plants are for projects where construction is unlikely to begin before the end of the decade, according to NEI. Yes, another eight years. For those seeking their 20-year license renewals, the plants can continue operating past the original license expiration date until the NRC makes a ruling on said application. On Sept. 6, the NRC announced it is developing an environmental impact statement and a revised waste confidence

decision and rule. The EIS and rule are expected to be completed within 24 months. "**Resolving this issue** successfully **is a Commission priority," said NRC Chairman** Allison M. Macfarlane. "Waste confidence plays a core role in many major licensing actions, such as new reactors and license renewals."

At the quickest they get a license in 42 months

Spencer '8 (Jack Spencer, Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation, "Time to Fast-track New Nuclear Reactors", http://www.heritage.org/research/reports/2008/09/time-to-fast-track-new-nuclear-reactors, September 15, 2008)

Nuclear technology can help to meet America's growing demand for reliable, clean, affordable electricity. This has led many politicians, including presidential candidate John McCain, to conclude that the nation needs to start building new nuclear plants now. The electric power industry has already begun plans to start building new reactors. While approximately 20 applications have been filed or are in preparation to build over 30 new reactors, no permits have been issued and no new plants have begun construction. A primary reason is that the regulatory process remains arduous and unknown. To overcome this, Congress should authorize a fast-track permitting process for a limited number of reactor projects. A Slow, Arduous Process The Department of Energy instituted the Nuclear Power 2010 program in 2002 as an effort to address the regulatory and institutional barriers to new reactors' near-term deployment. As its name implies, the original time frame called for new reactor deployment by 2010. Unfortunately, the program has not succeeded in this regard. Most believe that the earliest that a new plant will come on line is the latter half of the next decade. The problem is not technical or economic-new reactors are being built around the globe, and plans for more are being announced every month. The problem is political. **The** Nuclear Regulatory Commission (**NRC**), after so many years with no applications for new reactors, **does not have a proven process for efficiently licensing new reactors. The NRC estimates** that **it needs a minimum of 42 months to issue the design, site, and construction/operation licenses required for reactor construction to begin. This includes**-in addition to the safety assessments that are NRC's primary responsibility-**about two years for environmental reviews, a year for design reviews, and a year for public hearings. And even this time frame is contingent on complete applications and minimal opposition from outside interests.** This has led for calls to streamline the process.

And NRC shortage of workforce kills solvency

Weaver 7 (Lynn, President Emirtus of Florida Intsitute of Technology, "Fund NRC Nuclear Power Licensing")

The Nuclear Regulatory Commission has alerted several utilities that license reviews would be delayed at least a year. With all the concern in Congress over global warming, one might think that an increase in the number of nuclear power plants in the United States is inevitable, both to satisfy energy demands and to counter greenhouse-gas emissions. But that, of course, would be wrong. There are about 100 nuclear plants in the United States and they account for about 75 percent of our country's emission-free electricity. Utilities are preparing to build another 33 plants, including two in Florida. These would be the first reactors to be built in this country in many years, and federal and state energy

officials agree that it won't be possible to reduce U.S. greenhouse emissions without them. But it now appears that electric utilities might not be able to obtain licenses anytime soon to build new nuclear plants. **The reason for the licensing delay is simple-and-straightforward: a critical shortage of manpower at the Nuclear Regulatory Commission** - which is expected to become acute within a year. **The NRC knows that it needs to expand its workforce, because it's facing a flood of regulatory reviews for new nuclear plants and existing plants that are seeking a renewal of their operating licenses. But it doesn't have the money**.

The aff gets put behind 30 other pending applications

Shaw '12 (Jazz, "NRC approves First New Nuke Plants in Over 30 Years", 2/10/12)

This is only a drop in the bucket, sadly, **in terms of expanding the nation's fission reactor capability. 29 other applications have been shelved for years and may never be brought up again.** As the article notes, it's somewhat ironic that a chief factor in stopping the process is the glut of cheap natural gas we have, which is easing the sense of urgency for getting new nuke plants on line. Plus, these plants cost a lot of money to build before they begin delivering any returns on a very large investment. **But Vogtle should serve as in interesting test case so we can find out precisely how viable nuclear power will be as part of the "all of the above" energy plan we need**.

Turn- the plan only bogs down the NRC further

Luby 11(Abby, Freelance Journalist who has covered the Indian Point Nuclear Power Plant")
http://www.opednews.com/articles/The-End-of-the-NRC-Rubber-by-Abby-Luby-110715-812.html)

Entergy is also battling the state of Vermont who ruled last year to close their Vermont Yankee plant by 2012. Entergy, seeking to block the state decision, has filed a complaint against Vermont in US District Court, although the NRC approved the relicensing for the plant in March, 2011 for an additional 20 years. Vermont Yankee is not the only nuclear plant whose relicensing application has dragged on for years. **The relicensing process for** Entergy's Pilgrim Station reactor in Plymouth, Massachusetts, whose current **license** expires in June of 2012, **has also gotten bogged down under a swelling list of contentions** For utility companies, applying for a new license is an arduous process requiring thousands of documents for the NRC and specially formed review boards. The boards conduct public hearings -- a practice supposed to demonstrate transparency but which rarely amounts to more than a masked dog and pony show. **The real, laborious reviews take place inside the NRC's administrative law process within its licensing body,** the Atomic Safety and Licensing Board (ASLB). But **these are tightly controlled and severely restricted** in scope to one item: the safe management of the reactor's aging components. The reviews typically and glaringly omit such considerations as terrorism, health effects -- think cancer clusters near nuke plants -- safety procedures, evacuations.

Perception of failed NRC means no solvency

Gilinsky '8 (Previous NRC commissioner, 8 (Victor, independent consultant--primarily on matters related to nuclear energy. He was a two-term commissioner of the US Nuclear Regulatory Commission from 1975-1984, and before that Head of the Rand Corporation Physical Sciences Department. He holds an Engineering Physics degree from Cornell University and a Ph.D. in Physics from the California Institute of Technology, which granted him its Distinguished Alumni Award. "Pro-industry priorities derail NRC's

public-safety mission", Bulletin of the atomic scientists, 30 May, http://www.thebulletin.org/web-edition/roundtables/the-future-of-the-nuclear-regulatory-commission?order=asc#rt2324

Andy Kadak has a gentle way of putting it: "It's true that the [NRC] has had lapses in enforcement of its rules by giving the benefit of the doubt to utilities." I'd say it has effectively become a wholly owned subsidiary of the Nuclear Energy Institute, the industry's lobbying arm. This isn't only wrong; it's shortsighted on the industry's part. **An NRC that lacks public respect is a drag on nuclear expansion. When problems are close to home, everyone wants tough safety regulation** and full disclosure. Even Oklahoma Republican Sen. James Inhofe, ranking member on the Environment and Public Works Committee, and otherwise a fervent defender of everything nuclear, came down on the NRC when he discovered it had kept secret a leak from a nuclear processing plant in nearby Tennessee. In a July 2007 letter to NRC Chairman Dale Klein, he put it pretty well: "I know that you share my belief that **nuclear energy must play an increasing role in our nation's growing demand for energy. This will not happen unless and until the public and this committee have confidence that the commission will ensure public health and safety, and protect the environment**."

2NC SMR Wall

NRC says no- this takes out their advantages

Lobsenz ’10 (George Lobsenz, “White House Moves To Restrict DoE Nuclear Research”, http://www.freerepublic.com/focus/f-news/2429274/posts, January 15, 2010)

The **White House** has **proposed barring Energy Department research on fast reactor recycling of nuclear waste and technical support for licensing of small, modular light-water reactors,** drawing protests from Energy Secretary Steven Chu that **such prohibitions will have broad adverse effects, including hurting the U.S. nuclear industry's renaissance; crimping U.S. ability to influence other countries' fast reactor designs to address proliferation concerns**; and **taking away nuclear waste disposal options that might be considered by the administration's planned blue-ribbon panel on alternatives to the Yucca Mountain repository.** The policy dispute inside the Obama administration was revealed in a Dec. 22 letter from Chu to Peter Orszag, director of the Office of Management and Budget (OMB), commenting on proposals in the OMB "passback" budget plan sent to DoE late last year. The passback responded to initial DoE budget requests for fiscal year 2011. In the letter, obtained by sister publication The Energy Daily, Chu said he "strongly disagree[s] with the policy direction [proposed by OMB] concerning allowable nuclear energy R&D activities." Chu added: "**The OMB** [passback] **prohibits fast reactor R&D within the** [nuclear] **fuel cycle R&D program; prohibits light-water licensing and manufacturing support activities associated with small/modular reactors; and directs that the reactor enabling technologies program be renamed 'advanced concepts' and be entirely run as an investigator-initiated, competitive process**." Chu's letter did not explain the rationale for **OMB's** proposed nuclear R&D **restrictions**, which are surprising on several fronts and which appear **likely to harden perceptions among industry officials and others that the administration is fundamentally anti-nuclear.** In particular, OMB's opposition to letting DoE help U.S. nuclear vendors develop and license small, modular light-water reactors runs directly counter to broad bipartisan backing for such reactors as a promising area for rebirth of the U.S. nuclear industry and near-term deployment of emissions-free nuclear generation. Senate Energy and Natural Resources Committee Chairman Jeff Bingaman (D-N.M.) is among lawmakers who recently introduced legislation to boost development of small, modular reactors, most of which use existing light-water cooling technology and typically are limited to 50 megawatts in generating capacity. Their smaller size make them easier to tie into the grid and attractive for varied uses, such as powering military bases and remote villages. The **administration's opposition to fast reactor R&D likely reflects proliferation concerns related to their ability to produce weapons-usable plutonium.** However, **OMB's stance would halt U.S. research at a time when other major nuclear countries, such as France, Japan and Russia, are charging ahead with fast reactor design and development.** And on perhaps the most politically sensitive issue, **Chu said barring fast reactor R&D would hamstring efforts by DoE**--and thus by the administration's planned blue-ribbon nuclear waste panel--**to examine the potential of "modified-open fuel cycles" to help get rid of spent reactor fuel that had been destined for disposal in Yucca Mountain.** Experts say fast reactors are needed to efficiently burn recycled nuclear fuel and destroy high-level radioactive materials that otherwise would need deep geologic disposal. A "closed" fuel cycle would recycle all spent nuclear fuel in fast reactors; a modified-open fuel cycle using fast reactors would destroy some materials, leaving a reduced amount of waste for disposal. In his letter to OMB, Chu complained that by barring fast reactor research, the White House would effectively leave the nation with only the existing "once-through" fuel cycle, in which

reactor fuel is used once and then buried in a deep geologic repository such as Yucca Mountain, which the administration says is unsuitable for waste disposal and will be terminated. Sticking with the once-through fuel cycle would mean the U.S. government would have to site another underground repository such as the Yucca facility. "Prohibiting research and development on fast reactors under the fuel cycle research and development budget line effectively selects the once-through fuel cycle as the only fuel cycle to be pursued in the United States," Chu told Orszag. "The closed fuel cycle cannot be implemented without a fast neutron spectrum. Further, many if not most of the options being considered for the modified open fuel cycle would require a fast spectrum. Other than a fast reactor, the only options for achieving a fast spectrum would be to use particle accelerators or fusion-fission hybrids, both of which are not likely to be cost-effective." Chu noted that closed or modified-open fuel cycles would not be deployed for decades, but said research is needed now to provide options for future policymakers. And while the administration has pledged that its blue-ribbon panel will consider all alternatives to Yucca Mountain, Chu said of the OMB proposal: "[T]his language prohibition effectively removes an entire set of options from consideration by the blue-ribbon commission as it considers the back end of the fuel cycle." Chu said a ban on U.S. fast reactor research was also unrealistic and unwise in that other nations are pursuing the technology, which poses clear proliferation risks due to its ability to "breed" plutonium. "Several countries have fast reactors under construction for operation in the next two years, while France and Japan are currently designing their next fast reactors," Chu said. **"If the United States does not have a broad fast reactor research program (in addition to fast small/modular reactors), we will have no opportunity to influence design of these foreign reactors from a vital national security perspective such as proliferation resistance." On small, modular reactors, Chu suggested OMB's proposal would choke off one of the best avenues for a renaissance of the U.S. nuclear industry.** OMB's plan, he said, "prohibits all work on light-water...small, modular reactors, which is the only category of small, modular reactors capable of near-term deployment. These reactors offer the greatest potential to recreate a domestic nuclear industry wherein the United States contributes to the entire supply chain and regains a share of global leadership in one aspect of nuclear power." Further, Chu said those small reactors "offer immense potential benefits to domestic energy supply." Chu added that with **the Nuclear Regulatory Commission already loaded down with resource-intensive licensing reviews of big new reactors planned by electric utilities**, DoE was prepared to help review the large number of small, modular reactor designs to "select the best candidates for [NRC] license review. "**Without [DoE] licensing assistance leading to design certification, U.S. designs will not be utilized**," Chu said. "Furthermore, if these reactors are to compete, their U.S. manufacturing and supply chain must be optimized. "To fully realize the potential of light-water small, modular reactor designs, **the language prohibiting [DoE] licensing work on light-water reactor small, modular reactors must be removed, as well as prohibitions on work with industry to enhance manufacturing and construction techniques."** Chu also noted that industry would be required to help finance the DoE technical assistance, saying: "All work on light-water small, modular reactors, both to support licensing and manufacturing, will require cost share from industry." On the issue of DoE's proposed "reactor enabling technologies" program, Chu said OMB wanted to rename the program as "advanced reactor concepts." Chu objected to the name change, saying it did not accurately describe the intent of the program, which he said was to focus on "cross-cutting R&D activities that are relevant to multiple reactor designs."

This also jacks solvency- means SMR's licensing takes decades

O' Connor '11 (Dan O'Connor is a Policy Fellow in AEL's New Energy Leaders Project and will be a regular contributor to the website, American Energy League, "Small Modular Reactors: Miracle, Mirage,

or Between?", http://leadenergy.org/2011/01/small-modular-reactors-miracle-mirage-or-medium/, January 4, 2011,)

Judging only by this promising activity, it is tempting to dub the SMR a miracle. But the majority of these diverse designs have yet to be demonstrated. In fact, the demonstration stage of the South African project, Pebble Bed Modular Reactor (a HTR), stalled and faded in 2010 after losing government funding due to lack of customer interest. The importance of demonstration, especially in the highly-regulated US industry, cannot be overstated. **But even in the stages before the crucial demonstration step, skepticism over the SMR's promises abounds. The ASME EnComm noted regulatory, financial, operational, and logistical challenges. Treading the uncharted waters of Lego-like power plant construction will not be easy**. In a traditional plant, one reactor provides heat for one or a few steam turbines. In an SMR-based plant, each module drives one turbine with its own controls and operators. As such, few of the costs associated with these systems scale down with reactor capacity. The turbines do not come in a complimentary plug-and-play form either – they would have to be built on site. And while decentralization enables partial operation and online refueling, it also introduces the challenge of module co-operation, the need for numerous highly-trained operator personnel, and brand new reviews by the Nuclear Regulatory Commission (NRC). **This goes without mentioning the urgent and increased need for a more dynamic national approach to waste storage. Licensing questions remain too**. The one-time approval of a module before its mass production, bypassing a regulatory damper for each unit, is a highly-desirable advantage of SMR design. **But if a utility would like to increase its capacity over two decades by incrementally adding more modules, will it face the choice between building licensed, though dated, technology or waiting again for a license to build with state of the art modules**? Furthermore, as addressed in my past article, "Putting the Cart Before the Horse with Nuclear R&D" and its comments, **the waiting time even for a traditional design license is considerable. With each new SMR innovation, from an individualized control room to coolant choice, the licensing duration increases by as much as a decade, pushing the vital demonstration step further away. Additional costs associated with these regulatory complications and non-scalable systems could combine to nullify the SMR's affordability argument.**

NRC is incapable of solving the aff- they cannot build expertise or its extra-topical- overwhelms solvency

Spencer and Loris '11 (Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies, and Nicolas D. Loris is a Research Associate in the Roe Institute, "A Big Future for Small Nuclear Reactors?", February 2, 2011,)

These systemic **problems generally fall into three categories**: 1. **Licensing**. The Nuclear Regulatory Commis- sion (**NRC**) **is ill prepared to build the regulatory framework for new reactor technologies, and no reactor can be offered commercially without an NRC license**. In a September 2009 interview, former **NRC chairman** Dale E. **Klein said that small nuclear reactors pose a dilemma for the NRC because the commission is uneasy with new and unproven technologies and feels more comfortable with large light water reactors**, which have been in operation for years and has a long safety record.11 The result is that **enthusiasm for building** non-light-water **SMRs is** generally **squashed at the NRC as potential customers realize that there is little chance that the NRC will permit the project within a time- frame that would promote near-term invest- ment**. So, **regardless of which attributes an SMR might bring to the market, the regulatory risk is such that real progress on commercialization is difficult to attain**. This then leaves large light water reactors, and to a lesser extent, small ones, as the

least risky option, which pushes potential customers toward that technology, which then undermines long-term progress, competition, and innovation.

And they need to establish a new regulatory pathway- that's extra topical- or no solvency- their author

Spencer and Loris '11 (Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies, and Nicolas D. Loris is a Research Associate in the Roe Institute, "A Big Future for Small Nuclear Reactors?", February 2, 2011)

• **Establish a new licensing pathway**. **The current licensing pathway relies on reactor customers to drive the regulatory process. But absent an efficient and predictable regulatory pathway, few customers will pursue these reactor technologies**. **The problem is that the legal, regulatory, and policy apparatus is built to support large light water reactors, effectively discriminating against other technologies. Establishing an alternative licensing pathway that takes the unique attributes of small reactors into consideration could help build the necessary regulatory support on which commercialization ultimately depends**.14 • **Resolve staffing, security, construction criteria,** and fee-structure issues by December 31, 2011. The similarity of U.S. reactors has meant that the NRC could establish a common fee structure and many general regulatory guidelines for areas, such as staffing levels, security require- ments, and construction criteria. But **these regulations are inappropriate for many SMR designs that often have smaller staff requirements, unique control room specifications, diverse security requirements, and that employ off-site construction techniques**. **Subjecting SMRs to regulations built for large light water reactors would add cost and result in less effective regulation.** The NRC has acknowledged the need for this to be resolved and has committed to doing so, including developing the budget require- ments to achieve it. It has not committed to a specific timeline.15 Congress should demand that these issues be resolved by the end of 2011.

It's a question of NRC funding

Yurman '10 (Dan Yurman, The Energy Collective Thinktank, Marketing Communications Services for Energy Technologies, Member of the Advisory Board, the Energy Collective, a project of Social Media Today, Launched the official blog of the American Nuclear Society (ANS), In June 2011 I received a special recognition award from the American Nuclear Society for work on communication of nuclear energy science and engineering information to the news media and the public during the Fukushima crisis in Japan, "How to open running room for small reactors", http://djysrv.blogspot.com/2010/06/how-to-open-running-room-for-small.html, June 22, 2010)

What's on second? – **Is the NRC ready to review license applications for SMRs?** One industry observer told this blog via a comment published anonymously the NRC's view on SMRs goes something like this. starship enterprise "I don't have that much experience in warp phase induction coils, but I've done a bit of research. Scotty's Handbook of Miracles seems like the go-to reference. I figure I could get a copy from the library and read up on it." That's a tough review, but **the agency ability to get smart is hobbled by congressionally mandated budget policy**. Sanders says **the reason is its budget doesn't allow it to move up the learning curve ahead of industry intentions to submit license applications. "There's no money for R&D or to explore new technologies and reactor designs before they actually**

see one." This could be a problem for high temperature gas cooled reactors, which although they may be more competitive in some applications than light water reactors, will have a tougher time getting through the review process both for the reactor designs and for combined construction and operating licenses. "The NRC will have a steeper learning curve for them. The NRC hasn't seen a gas cooled reactor design for at least 20 years."